ANNEX 3

CONSULTATION REPORT
Draft Reference Offer of the Separated Entity

Consultation Report

28 March 2019

Ref: LAD 0319 084
1 INTRODUCTION

1.1 On 20 December, 2018, the Telecommunications Regulatory Authority (the "Authority") launched a Public Consultation (the "Consultation Document") on the Authority's proposed Reference Offer of the Separated Entity (the "RO") in respect of the new legal entity that will be formed (the "Separated Entity" or the "SE") through the legal separation of Bahrain Telecommunications Company B.S.C.(c) ("Batelco").

1.2 The purpose of the Public Consultation was to invite comments from interested parties on the suitability of the draft RO. The deadline for responses was 16:00 on 24 January 2019.

1.3 Authority received responses from BRE (Batelco), Viva, Zain, Etisalcom, Infonas WLL and NBN (Batelco).

1.4 The comments received from BRE (Batelco), Viva, Zain, Etisalcom, Infonas WLL and NBN (Batelco) are summarised in Annex 1 to this Consultation Report, as are the Authority's responses to each comment. Any changes to the RO that the Authority has made in response to the comments received from the stakeholders are also set out and explained under Annex 1. Viva and Zain's additional responses in respect of the questions set out in the draft RO are in Appendix 1 and Appendix 2 of this Consultation Report.

1.5 The latest draft of the RO (the "Draft Amended RO") is appended to the draft Reference Offer Order ("Draft RO Order") at Annex 2 to the consultation paper on the Draft RO Order ("the ROO Consultation").

1.6 This Consultation Report reflects the views of the Authority on comments received in response to the Consultation Document. The Authority's views as expressed in this Consultation Report are intended to provide an explanation of the Authority's position on the comments received from the respondents.
<table>
<thead>
<tr>
<th>Authority</th>
<th>Telecommunications Regulatory Authority of the Kingdom of Bahrain and any successors thereof</th>
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<tbody>
<tr>
<td>Batelco</td>
<td>Bahrain Telecommunications Company B.S.C.</td>
</tr>
<tr>
<td>BRE (Batelco)</td>
<td>Bahrain Telecommunications Company B.S.C. – Retail</td>
</tr>
<tr>
<td>Consultation Document</td>
<td>The document published on 20 December, 2018 which included the RO and which solicited responses to a number of questions set out in the Consultation Document</td>
</tr>
<tr>
<td>Draft Amended RO</td>
<td>The amended version of the RO appended to the Draft RO Order at Annex 1 to the ROO Consultation</td>
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<tr>
<td>Draft RO Order</td>
<td>The draft Reference Offer Order at Annex 1 to the ROO Consultation</td>
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<tr>
<td>Etisalcom</td>
<td>Etisalcom Bahrain W.L.L</td>
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<tr>
<td>Infonas</td>
<td>Infonas W.L.L</td>
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<tr>
<td>Licence</td>
<td>Has the same meaning as given to this term under Article 1 of the Telecommunications Law</td>
</tr>
<tr>
<td>NBN (Batelco)</td>
<td>Bahrain Telecommunications Company B.S.C. – Wholesale</td>
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<tr>
<td>ROO Consultation</td>
<td>The consultation paper on the Draft RO Order and related Draft Amended RO</td>
</tr>
<tr>
<td>Telecommunications Law / Law</td>
<td>The Telecommunications Law of the Kingdom of Bahrain, which was promulgated by Legislative Decree No. 48 in October 2002</td>
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<tr>
<td>SE</td>
<td>The new legal entity that will be formed through the legal separation of Batelco</td>
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<tr>
<td>Viva</td>
<td>Viva Bahrain B.S.C.</td>
</tr>
<tr>
<td>Viva Submissions</td>
<td>A summary of the key sections from Viva’s detailed report in respect of the RO</td>
</tr>
<tr>
<td>Zain</td>
<td>Zain Bahrain B.S.C.</td>
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<tr>
<td>Zain Submissions</td>
<td>A summary of the key sections from Zain’s detailed report in respect of the RO</td>
</tr>
</tbody>
</table>
Annex 1: Summary of responses received on the questions and the Authority’s conclusions

<table>
<thead>
<tr>
<th>Question 1: Do you agree with the key principles and timeframes (in particular the suggested review within 18 months) the Authority will apply in conducting its review of the RO, as set out in paragraph 6.7 of the Consultation document? If not, please set out why and provide alternative principles and timeframes which you consider will better meet the objectives of sector policy?</th>
</tr>
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<tbody>
<tr>
<td>BRE (Batelco)</td>
</tr>
<tr>
<td>BRE agrees with the Authority’s proposed approach to review the RO within a (minimum) period of 18 months. This would be an opportunity to produce a simpler, business friendly and updated supply contract. The document can also align itself as far as is possible with an updated regulatory matrix.</td>
</tr>
<tr>
<td>Viva</td>
</tr>
<tr>
<td>Viva does not agree and states that there must be 6 monthly updates to the RO, as required by Article 57(b) and the Access Regulations (see also: Section 8 of the Viva Submissions at Appendix 1 of this Consultation Report).</td>
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</table>

Consultation Document
Moreover as already communicated to Viva on a multiple of occasions, its interpretation of Article 57(b) of the Law is mistaken. Article 57(b) of the Law is not applicable until such time as the Authority has conducted an ex ante market analysis and determined that the SE enjoys a position of dominance in a relevant telecommunications market.

Zain

- 6 months after the issuance of the RO; due consideration should be given to the introduction of the Ultimate Backhaul Solution (i.e. for the provision of a mobile backhaul product – this requires a superior backhaul solution for the expected roll-out of new technologies and associated traffic growth).

- The migration to EoI should occur as soon as possible to achieve a level playing field. The SE’s proposal of a (24) month timeline to achieve EoI migration for all services is unrealistic and is not in line with international benchmarks (i.e. New Zealand and the UK).

- The SE should provide the equivalent processes as a minimum for: (i) service ordering and provisioning; (ii) fault management; and (iii) access to infrastructure information.

- If this is not attainable from the outset, then the Licensee should operate with the BRE on an arms-length basis and that the BRE should follow the process availed to the Licensed Operators in order to achieve a level playing field rather than granting the BRE two years ahead advantage. For example, meeting the EoI obligation on the delivery of a bitstream order can be achieved from the first day using any one of two options:

As noted in the Authority’s Consultation Document on the RO (para 6.7), the Authority intends to conduct a review of the RO within 18 months of its publication. The Authority also notes that the second public consultation on the draft SE License (LAD/0219/055) published on 28 February 2019 and section 4.9 of the Amended SE License propose that the Authority may request more frequent submission of a revised draft RO from the SE. The Authority expects to commence the work needed for its review of the initial RO shortly after publication of the RO itself.

In terms of services available under the initial RO, the Authority proposes to include a new optical wavelength based active service (Lambda service referred to as OWS) to address Licensed Operators’ backhaul needs. In addition, the Authority is proposing inclusion of a dark fibre fronthaul access service (FAS) that would be available to MNOs.

The introduction of EoI impacts on many processes and systems of the SE. The Authority considers that a twenty-four (24) month timeline for full EoI across all products and services is more realistic.
- Providing the OLOs with access credentials to a portal that allows authorised personnel to place the bitstream orders automatically; or
- Providing the OLOs with a dedicated resource stationed at the OLO premise to use his/her system access to place the bitstream orders.

- If both of the above options are not feasible, then BRE should follow the same manual ordering process that OLOs will be following (i.e. filling forms and sending e-mails).

- Regarding the 18 month timeline for a full review of the RO: Zain recommends an on-going review process should be instituted following the publication of SE’s first RO, which will allow amendments to service portfolio descriptions, pricing and service delivery obligations in a shorter timeframe.

- Pursuant to Article 6.9 and in respect of the SE business plan, Zain recommends that the SE’s business plan should not be construed solely based on assumptions and forecasts which are not underpinned by actual forecasts and insights provided by the OLOs. Capacities distribution and technological investments roadmaps are critical inputs that Zain recommends should be considered by the Authority during its review of the SE’s business plan.

It is recognised however, that there will be benefits in prioritising the implementation of EOI on a service basis as well as potentially on an individual process basis. The Authority considers that a process and systems audit will need to be conducted in order to identify the individual steps needed to reach EOI. The Authority therefore has included in the Draft RO Order provisions that provide for the Authority to appoint an independent auditor, to conduct an audit of the SE’s systems and processes, and to produce an audit report within six (6) months from the date of the final Reference Offer Order. The costs of the auditor would be borne by the SE.

The Authority has set out in the Draft RO Order proposed timelines for full EOI for individual products and services, which are to be met from the date of completion of the audit. This means that full EOI for certain services that were the subject of the Consultation Document can be available ahead of twenty-four (24) months.

In addition, the Authority has proposed in the second public consultation on the draft SE License (LAD/0219/055) published on 28 February 2019 and specifically in section 4.11 and 4.12 of the Amended SE License timeframes for the logical and physical separation of the SE’s Management Information Systems, Business Support Systems and Operational Support Systems.

The Authority agrees that it is important for the SE to ensure that the same portal is available to all parties who wish to take services from the SE. The Authority has proposed in section 5.4 of the Amended SE License that a single common interface for OLOs (i.e., such that OLOs and BRE would have access to the same system) to order and track the progress of orders should be made available from day one.
As regards Zain's comments relating to the SE's business plan, the Authority agrees that the SE's business plan should be based on forecasts provided by OLOs. The Authority has extensively engaged with the SE in this respect.

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<tr>
<th>Etisalcom</th>
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<tr>
<td>Yes.</td>
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<tr>
<th>Infonas</th>
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<tbody>
<tr>
<td>No - a quarterly review would be more suitable as the initial stages of the separation will be a critical time which may bring/ highlight unforeseen issues.</td>
<td>As noted in the Authority's Consultation Document on the RO (para 6.7), the Authority intends to conduct a review of the RO <strong>within</strong> 18 months of its publication. The Authority also notes that the second public consultation on the draft SE License (LAD/0219/055) published on 28 February 2019 and section 4.9 of the Amended SE License proposes that the Authority may request more frequent submission of a revised draft RO from the SE. The Authority expects to commence the work needed for its review of the initial RO shortly after publication of the RO itself. The Authority does not consider however that it would be practical to mandate quarterly review of the RO given the timeframes needed to conduct such a review, and the need for a certain period after introduction of the RO to properly assess take-up of the services.</td>
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</table>
NBN recognises that there is a massive change underway in the Bahraini telecoms market place. It is impossible to predict how all of the various elements will develop and NBN recognise that the TRA has suggested that it will conduct a RO review within 18 months of the publication of the RO.

The use of a transitional RO is understood and accepted by NBN (which will involve constant iterations and developments).

There may need to be a further review so NBN suggest that – rather than setting a prescriptive period – the TRA commences this review, at least after, a minimum of 18 months have elapsed from the date of agreement of the RO or earlier if material changes in circumstances have occurred such that the RO may no longer be appropriate.

During this period, however, NBN will continue work on product development, using its new pre-sales and technical sales teams to work with customers to develop and collaboratively construct new and enhanced product offerings. As a result, the RO, in its transitional form, will be constantly changing and developing in line with customer demand throughout this period.

At this stage, the TRA is intending to ensure that NBN publishes the final RO in March 2019. The achievement of that date depends on the impact of this consultation and the views of the various stakeholders as well as the wider dialogues around the Licence.

NBN recommends that this date is not prescriptive but that the parties

The Authority disagrees with NBN (Batelco)’s suggestion that a review of the RO should only be commenced after 18 months has elapsed.

As noted in the Authority’s Consultation Document on the RO (para 6.7), the Authority intends to conduct a review of the RO within 18 months of its publication.

The Authority also notes that the second public consultation on the draft SE License (LAD/0219/055) published on 28 February 2019 and section 4.9 of the Amended SE License propose that the Authority may request more frequent submission of a revised draft RO from the SE. The Authority expects to commence the work needed for its review of the initial RO shortly after publication of the RO itself.

The Authority welcomes NBN (Batelco)’s indication that it will continue to work with OLOs on product development. The Authority has proposed in the Draft RO Order the mandatory establishment of an industry forum that will enable OLOs to communicate their needs and requirements to NBN (Batelco) (the SE) on an ongoing basis. This would be alongside (i.e., in addition) to OLOs’ (Access Seekers’) ability to request the introduction of new / amended RO Services at any time.
<table>
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<tr>
<th>Question 2: Does the draft RO meet (a) current, and (b) future needs of Licensed Operators (including Batelco Retail)?</th>
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<tbody>
<tr>
<td><strong>BRE (Batelco)</strong></td>
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<tr>
<td>BRE believes that the draft transitional RO reasonably meets the current product set offered by BRE to its customer base. Whilst addressing those wholesale inputs to satisfy the technology and deployment targets in NTP4, BRE recognizes that upon implementation of the foundation pillars of the Separated Entity, in particular implementation of Equivalence of Inputs and identification and transfer of assets, there will need to be different RO products in the future.</td>
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<tr>
<td>BRE’s comments are noted.</td>
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<tr>
<td><strong>Viva</strong></td>
</tr>
<tr>
<td>No, it does not from Viva’s perspective. In particular, the RO must provide for passive access to meet Viva’s current and future needs. The active products need to be fit-for-purpose, which they are not currently.</td>
</tr>
<tr>
<td>The Authority has considered Viva’s requirements along with those of other Licensed Operators. The Authority has proposed additional RO products in the revised Draft RO Order. This includes the inclusion of an optical wavelength based active service (OWS) and provision of a dark fibre fronthaul access service (FAS).</td>
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### Zain

The draft RO falls short of the current and future needs of Zain in some areas. The price and non-price terms of the SE draft RO have not materially changed from Batelco's existing RO and OLOs will face two critical issues almost immediately unless a revision takes place: (a) significant increase in costs (b) non-price, discriminatory service levels.

### Etisalcom

Yes.

### Infonas

No it does not:  
- There are missing active products that offer Layer 1/1.5 services (i.e. SDH and OTN). These services are not covered by any product listed.

The Authority has considered Zain's requirements along with those of other Licensed Operators. The Authority has proposed revisions to the existing product set included in the draft RO, as well as revisions to the price and non-price terms. Specifically, the Authority has proposed in the Draft RO Order and Draft Amended RO (a) reductions to price terms for all services that were included in the draft RO, as well as (b) a number of additional non-price measures to guard against discrimination. Examples include: improved Service Levels, Service Credits and Service Penalty regime, improved availability of a wider range of speeds, a framework for Licensed Operators to provide forecasts, mandated establishment of an industry forum to enable OLOs to discuss their product and technical requirements with the SE.
in the draft RO while these products are currently delivered by Infonas to its customers (more details in response to question 5).

- Infonas’s current customers’ requirements (such as Amazon web services) require 100 Gbps services. Infonas has also received requests for such capacities from US Navy, and therefore forecasts such requirements to be regularly made. The above speeds are not offered by any product listed in the draft RO.

- Infonas is also concerned with the SE’s use of US Navy non-compliant equipment; particularly as the SE is based on Huawei technologies, which as per the US Government, is deemed non-compliant. This results in Infonas’s need to have dark fiber/duct access to be able to retain its customer and compete for any future business.

The Authority has included in the Draft Amended RO provision for SDH and OTN services (e.g., in the WDC Service Description) as well as services up to 100Gbps.

The Authority has, in the Draft Amended RO, taken into account requests for services to enable Licensed Operators such as Infonas to meet customer requirements, such as US Government requirements. The Authority has proposed wording in the MBS, WDC and DS Service Descriptions to ensure that OLOs will be able to choose alternative CPEs from multiple vendors rather than a single vendor-specific mandated Huawei solution.

### NBN (Batelco)

- NBN’s portfolio currently provides many of the fundamental building blocks for OLOs to offer a variety of retail services and to compete with one another and with BRE. The RO makes provision for OLOs and BRE to request new services should they be necessary to meet the market’s future needs.

- The RO does not cover all of the services that retail providers currently require to offer end user services and this is to be expected, especially for certain legacy services. However, NBN will continue to develop service offerings in line with reasonable customer demand.

The Authority notes that OLOs can request new services under the Draft Amended RO. The Authority however, considers it is important, especially at the outset and during the initial stages after launch, that the SE proactively engages with OLOs by way of an industry forum to understand OLO needs and requirements for the existing product/service set, as well as the need for proposed improvements and/or new products/services. The Authority has proposed that an industry forum is established and that the SE be mandated to participate in this forum as part of the Draft RO Order. It is important to ensure that the SE’s product set is fit for purpose and meets OLOs’ current and future needs.
NBN’s product design will be focused on meeting the reasonable needs of customers in an economically viable way (so that OLOs can in turn meet end user demand and deliver on the ultimate goals of the NTP4).

The Authority believes it is important that the RO addresses the fundamental legacy needs of OLOs. OLOs must not be at a disadvantage when compared to Batelco Retail (BRE). This means that where an individual OLO requires certain wholesale legacy products to maintain their business, the SE should continue to meet those reasonable requirements.

Lastly, the Authority notes (NBN Batelco)’s reference to economic viability. Indeed, the Authority is cognisant of the need for SE to be financially viable and ensuring the SE can be financially viable has been one of the key factors the Authority has taken into account when considering the appropriate price terms for the Draft RO Order. However, it is the Authority’s view that, because of the largely fixed cost nature of the SE business, the SE will also be able to enhance its own financial performance by providing a product set which meets the reasonable requirements of OLOs and so promotes the take-up of its products / services.

<table>
<thead>
<tr>
<th>Question 3: Do you support the inclusion in the SE RO of all the product schedules included in the draft? If not, please set out which product schedules you consider should be excluded, and why.</th>
</tr>
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<tbody>
<tr>
<td>BRE (Batelco)</td>
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<tr>
<td>BRE is in favour of simplifying, rationalising and updating the proposed draft transitional RO including its product schedules into a business friendly document consistent with the new regulatory matrix. BRE is of the view that some of the product schedules for both bitstream and leased lines can be combined into one service description (albeit with different pricing, technical specifications and service levels if required).</td>
</tr>
<tr>
<td>In the Draft RO Order and Draft Amended RO the Authority has rationalised and where possible simplified the RO Service Descriptions. For example, the Authority has:</td>
</tr>
<tr>
<td>• merged WBS, Bitstream and Bitstream Plus into WBS;</td>
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</table>
merged WLA and WDC into WDC. The WDC Service Description now also contains SDH services;

- MBS and DS are currently still addressed separately. This is because the Authority considers, based on the submissions received, that these services have different quality and performance requirements. However, the Authority is continuing to review whether there could be merit in merging these services;

- WSDSL should not be offered by the SE, but should continue to be offered by Batelco Retail (BRE).

The Authority understands that LLCO is available only for legacy customers and will not be made available to new customers.

The Authority has also proposed the inclusion of two additional services into the Draft RO Order and Draft Amended RO, namely:

- Optical Wavelength Access Service (OWS) which is a new optical wavelength based active service (Lambda service); and

- Fronthaul Access Service (FAS) for MNOs, which is a dark fibre product, limited to point to point connectivity between the Baseband Unit and the Remote Radio Head of the Network.

Viva requests the TRA to consider the following three sets of active wholesale products (in addition to the Dark Fibre):

- Bitstream service: merge WSDL, Bitstream and Bitstream Plus Products into one product;

- Data services: merge WDC, WLA and LLCO into one product; and

Please refer to the immediately preceding response.
- Mobile Backhauling services: merge MBS and DS into one product

**Zain**

Some of products service descriptions in the draft SE RO either overlap or should not be included in the Fixed Telecommunications Infrastructure Licence. Zain’s proposals on the products sets and corresponding documentation schedules that should form the structure of the SE RO are:

- MBS/DS: Merge with DS/MBS (proposed product name: MBS)
- WBS/Bitstream/Bitstream Plus: Merge with Bitstream and Bitstream Plus/WBS and Bitstream Plus/Bistream and WBS (proposed product name: WBS)
- LLCO/WDC: Merge with WDC (proposed product name: WDC)
- WDC: Merge with WLA and LLCO (proposed product name: WDC)
- WSDSL: To be offered by BRE and not SE (It is a resale service that requires ISP license)
- Introduce Ultimate Backhaul Service (proposed product name: UBS)
- Introduce International Cross-Connect Service (proposed product name: ICCS)

The proposed purpose of each recommended product is set out in the table on page 7 of Zain’s response to the consultation.

Please refer to the immediately preceding response.

In addition, the Authority has reviewed the comments provided by stakeholders concerning international connectivity and specifically which entity within the Batelco group should hold the relevant IFL. The Authority’s final position on an international cross-connect service is still being formulated. Indeed, the Authority will be conducting a market review of the entire supply chain for international connectivity later this year. The Authority considers it prudent not to take any action at this stage that might pre-judge the outcome of such review.

**Etisalcom**

This service has been removed from the Draft Amended RO. The Authority considers that WSDSL should not be offered by the SE, but should continue to be offered by Batelco Retail (BRE).
| **WSDSL** | WSDL should not be part of the SE because it carries managed services and it also requires IP transit to provide the services. Furthermore, OLOs need to be resell the services to other small OLOs. |
| **Infonas** | WDSL should not be a part of the SE RO. Infonas is of the opinion that SE should not be delivering to the end customer. This service has been removed from the Draft Amended RO. The Authority considers that WSDL should not be offered by the SE, but should continue to be offered by Batelco Retail (BRE). |
| **NBN (Batelco)** | - The present RO is entirely transitional and NBN expect to see collaborative dialogues with NBN's customers leading to constant evolution of the service offerings from NBN.  
- The services in the product schedules represent a service offering designed to ensure that licensed downstream providers (including BRE and OLOs) can offer a wide range of services to end users in the Kingdom. The Authority notes that the draft RO submitted to the Authority, and which was the subject of the Consultation Document, represents a starting point. The RO will need to be updated and refined going forward to address OLOs' existing and future requirements. In the meantime, the Authority has reviewed the existing draft RO and proposed a number of amendments to it, in response to stakeholder feedback from Licensed Operators that the existing draft RO product set fails to sufficiently address their requirements. These are reflected in the Draft Amended RO. The Authority has also rationalised and where possible simplified the RO Service Descriptions. For example, the Authority has:  
  - merged WBS, Bitstream and Bitstream Plus into WBS;  
  - merged WLA and WDC into WDC. The WDC Service Description now also contains SDH services; |
MBS and DS are currently still addressed separately. This is because the Authority considers, based on the submissions received, that these services have different quality and performance requirements and are also priced differently. However, the Authority is continuing to review whether there could be merit in merging these services;

- WSDSL should not be offered by the SE, but should continue to be offered by Batelco Retail (BRE).

The Authority understands that LLCO is available only for legacy customers and will not be made available to new customers.

The Authority has also proposed the inclusion of two additional services into the Draft RO Order and Draft Amended RO, namely:

- Optical Wavelength Access Service (OWS) which is a new optical wavelength based active service (Lambda service); and
- Fronthaul Access Service (FAS) for MNOs, which is a dark fibre product, limited to point to point connectivity between the Baseband Unit and the Remote Radio Head of the Network.

**Question 4: Do you have any comments in relation to the inclusion/exclusion of legacy products in the draft RO?**

**BRE (Batelco)**

<table>
<thead>
<tr>
<th>The proposed offering is a starting point given the products cover broadband access and domestic data connectivity. BRE notes that ultimately the</th>
<th>As indicated above, the Authority will continue to review the completeness</th>
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</table>
Separated Entity will be supplying wholesale products on an EOI basis, subject to exceptions where EOO may be permitted. BRE also note the aim in the NERF for the Separated Entity to be efficient, as well as fulfilling the policy objectives set out in paragraph 24 of NTP4, in particular implementing separation "on a gradual basis" (para 24 (g)).

BRE's view is that this was to try and minimize disruption to Batelco's business operations. Further implementation activity is required before it can be decided whether the Separated Entity should offer legacy products or whether they should continue to be provided by Batelco BSC internally to BRE and other licensed operators pending any continuation or decommissioning and phasing out of products (subject always to taking the end customer's overall needs into account).

and suitability of the product set in the Draft Amended RO, after publication. This includes also the position regarding legacy services.

In terms of the move towards EOI, the Authority considers that the SE will be required to achieve full EOI within twenty-four (24) months after launch, unless the Authority determines otherwise, in which case the SE will be required to ensure services are provided on an EOO basis. The Authority considers that EOI could be approached on a service-by-service basis, addressing EOI for those services which OLOs will most likely need on a priority basis to be able to service existing customers. The Authority has suggested timelines in the Draft RO Order for each of the services in the revised Draft Amended RO. The Authority invites specific feedback on the proposed approach to EOI for such services, including the suggested prioritisation of services, as well as the proposed timelines for each.

As regards legacy services, the Authority considers however that WSDSL should not be offered by the SE, but should continue to be offered by Batelco Retail (BRE).

Viva

No further comments.

Zain

The Authority notes Zain's response. The Authority urges Zain to provide
Zain has not completed its comprehensive review of the supporting schedules accompanying the main body of the RO but wants to point out that these schedules contain legacy provisions that are not relevant anymore. Zain will provide its comments on schedules 2-5 and 8-9 as soon as possible. Its fuller comments on the RO as part of the Authority’s consultation on the Draft RO Order (and revised Draft Amended RO). It is important that Zain – and all Licensed Operators - uses this opportunity to provide their feedback.

In the meantime, the Authority considers however that WSDSL should not be offered by the SE, but should continue to be offered by Batelco Retail (BRE).

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<thead>
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<th>Etisalcom</th>
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<tr>
<td>Please specify what will be the fate of Local Loop Unbundling and Bitstream over copper as in the TBS document mainly talks about the GPON fiber.</td>
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<tr>
<th>Infonas</th>
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<tr>
<td>The Authority understands that Batelco’s existing copper network will be transferred to the SE. The Authority expects that over time, the SE may seek to phase-out use of copper and migrate services provided over existing copper assets to the SE’s fibre assets.</td>
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<th>Infonas</th>
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<tr>
<td>The Authority points out that it has included provisions in the draft SE Licence on which the Authority consulted in December 2018 (LAD/1218/344) (which are included at section 5.8 of the Amended SE License, LAD/0219/055) that enable the Authority to request details from the SE (for approval by the Authority) of the SE’s proposed roadmap for migration of services provided over copper based assets away from such copper based assets to provision of such services over the SE’s fibre based assets.</td>
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</table>
Legacy products should form a part of the draft RO (e.g. copper falls under legacy products to areas that fibre has not been deployed to date).

Please refer to the immediately preceding response.

### NBN (Batelco)

The present RO is transitional and NBN is committed to working collaboratively with its customers to rationalise and enhance product sets to reflect reasonable customer demand and meet the NTP4 objectives.

The Authority notes that the draft RO submitted to the Authority and that was the subject of the Consultation Document represents a starting point and will need to be updated and refined going forward to address OLOs’ existing and future requirements.

In the meantime, the Authority has reviewed the existing draft RO and proposed a number of amendments to it, in response to stakeholder feedback from Licensed Operators that the existing draft RO product set fails to sufficiently address their requirements. Please see the Authority’s comments above, in relation to Question 3. These are reflected in the Authority’s Draft Amended RO.

The Authority considers it important, especially at the outset and during the initial stages after launch, that the SE proactively engages with OLOs by way of an industry forum to understand OLO needs and requirements for the existing product / service set, as well as the need for proposed improvements and/or new products / services. The Authority has proposed under the Draft RO Order the mandatory establishment of an industry forum that the SE will be required to participate in. It is important to ensure that the SE’s product set is fit for purpose and meets OLOs’ current and future needs.
Question 5: Please indicate if you consider any products are missing from the draft RO. Please provide a high level product specification and explain why you believe such products should be included in the RO, considering for example, how such products will enable OLOs to continue to provide their current retail product set, and to compete effectively.

<table>
<thead>
<tr>
<th>BRE (Batelco)</th>
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<tbody>
<tr>
<td>The proposed products and services in the draft initial RO are reasonable to fulfill BRE’s current requirements, however, BRE believes that future products may be required.</td>
</tr>
<tr>
<td>BRE’s comments are noted. In response to comments received from other Licensed Operators, the Authority has proposed amendments to the existing product set under the draft RO, including rationalisation of existing products as well as the inclusion of additional products and services. Please see the Authority’s comments in relation to Questions 3 and 4 above.</td>
</tr>
<tr>
<td>The Authority notes that the draft RO submitted to the Authority and that was the subject of the Consultation Document represents a starting point and will need to be updated and refined going forward to address all Licensed Operators’ existing and future requirements.</td>
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<table>
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<tr>
<th>Viva</th>
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<tr>
<td>The draft RO has a range of products that are poorly defined and are overlapping. The product set should be rationalised and, as part of this rationalisation, the application to which the service can be applied needs to be generalised. The other major omissions are as follows;</td>
</tr>
<tr>
<td>In the Draft Amended RO the Authority has rationalised and where possible simplified the RO Service Descriptions. For example, the Authority has:</td>
</tr>
<tr>
<td>• merged WBS, Bitstream and Bitstream Plus into WBS;</td>
</tr>
</tbody>
</table>
- The provision of Dark Fibre access services for a wide variety of applications including:
  - mobile back-haul and mobile front-haul, and
  - access to international submarine cables form the Cable Landing Stations’ manholes to the border on Bahrain international territorial water in order to promote for competition in the provision of international capacities on these submarine cables in line with the NTP4 direction etc.
- GPON dark fibre to promote for innovation in the provision of FTTx fibre broadband services.
- The provision of duct access to Cable Stations from ASs PoPs; and
- The provision of duct access where SE is unable to deliver other forms of service in a timely or cost-effective manner.

- merged WLA and WDC into WDC. The WDC Service Description now also contains SDH services;
- MBS and DS are currently still addressed separately. This is because the Authority considers, based on the submissions received, that these services have different quality and performance requirements and are also priced differently. However, the Authority is continuing to review whether there could be merit in merging these services;
- WSDSL should not be offered by the SE, but should continue to be offered by Batelco Retail (BRE).

The Authority understands that LLCO is available only for legacy customers and will not be made available to new customers.

The Authority has also proposed the inclusion of two additional services into the Draft Amended RO, namely:

- Optical Wavelength Access Service (OWS) which is a new optical wavelength based active service (Lambda service); and
- Fronthaul Access Service (FAS) for MNOs, which is a dark fibre product, limited to point to point connectivity between the Baseband Unit and the Remote Radio Head of the Network.

In addition, the Authority has reviewed the comments provided by stakeholders concerning international connectivity and specifically which entity within the Batelco group should hold the relevant IFL. The Authority’s final position on an international cross-connect service is still being formulated. Indeed, the Authority will be conducting a market review of the entire supply chain for international connectivity later this year. The Authority considers it prudent not to take any action at this stage that might pre-judge the outcome of such review.
### Zain

Zain has reflected its opinion, comments and proposed amendments to the relevant RO product service descriptions in separate a marked-up MS Word document (discussed at the workshop amongst Zain, the Authority and the Authority’s appointed consultant on 16 January 2019). The amended service descriptions apply to WBS, MBS and UBS.

The input provided by Zain has been taken into account.

The Authority has proposed a number of changes in the Draft Amended RO to address Zain’s comments. These include changes to certain terms in the definitions sections, the inclusion of an initial minimum set of requirements for monitoring of the provided services, improvement in the fault management process, improved minimum protection for MBS and DS, improvements to the Service Levels and associated Service Credits, restrictions on the SE to safeguard against the SE having direct contact with the OLO’s End User, changes to the speeds available for the WBS Service.

### Etisalcom

- Draft RO fails to incorporate the international connectivity component for OLOs. OLOs get a lot of requests from customers in Bahrain looking to establish connectivity internationally. Furthermore, OLOs also want to expand their own footprint for which it has to rely on Batelco. This international connectivity component (that includes products such as Global MPLS, IPLC, access to landing stations and international cables such as FOG, FLAG etc which Batelco owns as part of the international consortium) should also be incorporated. RO should specify what happens to these international connectivity products after the split.

The Authority has reviewed the comments provided by stakeholders concerning international connectivity and specifically which entity within the Batelco group should hold the relevant IFL. The Authority’s final position on an international cross-connect service is still being formulated. Indeed, the Authority will be conducting a market review of the entire supply chain for international connectivity later this year. The Authority considers it prudent not to take any action at this stage that might pre-judge the outcome of such review.
Pricing structure of the international connectivity and bandwidth speeds should be defined.

- Etisalcom recommends that all the services mentioned in the Draft RO should be offered on the same aggregator link with a backup option and class of service. It will also help in introduction of new services in the future and would help OLOs in avoiding unnecessary aggregator link costs. As per the RO, OLO needs to take 10GB WBS Aggregator link to provide WBS services. As all OLOs already have aggregator links, upgrades should be applied on case-to-case basis, as per each OLO’s individual requirement.

- Draft RO does not shed light on the status of "bh" domain (currently managed by Batelco) - this should come under SE jurisdiction.

There has been a view put forward by a number of OLOs that the Aggregation Link should be made available on a per Service basis. Additional Aggregation Link speeds have been included in the revised RO. For example, the WDC, MBS and DS Service Descriptions envisage provision of an Aggregation Link for speeds of up to 100 Gbit/s.

The Authority notes Etisalcom’s comment in relation to the "bh" domain. The Authority does not consider that this should form part of the SE RO but should remain with Batelco Retail.

### Infonas

Yes, there are missing products:

- Products that cover Layer 1/1.5 active services such as SDH, OTN, and Clear Wavelength. These services are currently provided by Infonas to customers in Bahrain. Although SDH and OTN terms are mentioned in the WDC product description, SDH and OTN services do not seem to be covered because the WDC description is all about Ethernet point-to-point (Layer2):
  - **High Level Product description for Layer 1/1.5 product:** It is a point-to-point service that works on Layer 1/1.5 which includes SDH, OTN and Clear Wavelength services which are totally different from Layer 2 Ethernet network. In those services, the

The WDC Service Description has been amended to include, where appropriate, SDH and OTN services. Clear Wavelength services are met through the proposed inclusion of the OWS.
handoff interfaces must be as per the SDH and the OTN standards. Moreover, in those services, the connections shall be from the End User Premises / Point of Presence to another Point of Presence (and NOT to an aggregation point). These Layer 1/1.5 technologies and services are main part of WAN networks for big service providers as well as customers.

- **Clear Wavelength**: The clear wavelength means a specific capacity (2.5G in Infonas’s case) over pure OTN path with no SDH cross connect along the path. This enables the customer to change the Path structure without referring back or requesting the changes from the telecom provider. For instance, in case of SDH, a STM16 (2.5G) can be structured as 16x STM1 or 4xSTM4 or 1x STM16 and the customer must ask the Telecom provider each time they want to change the structure. However, if the 2.5Gbps clear wave is delivered over pure OTN, then the customer can change the circuit structure without having to request any changes from the telecom operator and without having to wait for the changes to take effect. Infonas is delivering these services to customers in Bahrain.

- Dark fibre and duct services are missing from the draft RO, resulting in a capacity limitation. This is based on the fact that none of the products listed in the RO (including WDC services) support more than 10Gbps services, nor do they provide US government compliant equipment as explained in Infonas’ response to question 2 above.

The Authority has proposed the inclusion of two additional services into the Draft Amended RO, namely:

- Optical Wavelength Access Service (OWS) which is a new optical wavelength based active service (Lambda service); and
- Fronthaul Access Service (FAS) for MNOs, which is a dark fibre product.

Based on the responses received to the Consultation Document, the Authority considers that these additional products should meet OLOs’ current requirements for the next 12-18 months, during which time the
Authority proposes to conduct a review of the RO. As part of the Authority’s review, the Authority may consider, among other matters, whether the SE should be required to make dark fibre available for backhaul. In so doing the Authority would take into account the technical requirements of OLOs, based on recognised industry standards, the state of provision of the SE’s active service portfolio and any comparative active products, and be in a position to develop pricing terms for such a service (if required) which can balance the needs of all parties, taking into account how the performance of the SE and the take up of its existing product set.

In response to Infonas’ comments regarding US government compliant equipment, the Authority has proposed wording in the MBS, WDC and DS Service Descriptions to ensure that OLOs will be able to choose CPEs from alternative vendors rather than a single vendor-specific Huawei solution.

<table>
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<tr>
<th>NBN (Batelco)</th>
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<tbody>
<tr>
<td>NBN are establishing new pre-sales and technical teams (to address any products that OLOs deem are missing from the draft RO) alongside the wider new processes/systems that will underpin the new model of service offerings.</td>
</tr>
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</table>

The Authority notes that the draft RO submitted to the Authority and that was the subject of the Consultation Document represents a starting point and will need to be updated and refined going forward to address OLOs’ existing and future requirements.

In the meantime, the Authority has reviewed the existing draft RO and proposed a number of amendments to it, in response to stakeholder feedback from Licensed Operators that the existing draft RO product set fails to sufficiently address their requirements. Please see the Authority's
The Authority considers it important, especially at the outset and during the initial stages after launch, that the SE proactively engages with OLOs by way of an industry forum to understand OLO needs and requirements for the existing product/service set, as well as the need for proposed improvements and/or new products/services. The Authority has proposed under the Draft RO Order the mandatory establishment of an industry forum that the SE will be required to participate in. It is important to ensure that the SE’s product set is fit for purpose and meets OLOs’ current and future needs.

Question 6: Does the draft RO include all the wholesale inputs required to support the Batelco Retail product portfolio?

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<tr>
<th>BRE (Batelco)</th>
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<tr>
<td>BRE believes (as a starting/transitional point) that the SE’s current wholesale input supports BRE’s product portfolio. As more enhanced equivalence is implemented, BRE is looking forward towards enhancing the processes and procedures between BRE and the SE (which ultimately would benefit OLOs), for example, a new mechanism to request:</td>
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As regards the SE’s proposed product set, the Authority refers BRE (Batelco) to the Authority’s comments in relation to Questions 3 and 4 above.

The Authority notes BRE’s comments regarding proposed enhancement of processes and procedures between BRE and the SE. The Authority
a) infrastructure in newly developed areas and fiber access request for key clients on an ad-hoc basis;  
b) new speeds and higher uploads;  
c) volume discounts.  

points out that the SE must not prefer BRE as regards other Licensed Operators. The processes and procedures between BRE and the SE (as well as any proposed enhancements) must also be made available to OLOs at the same time. BRE is not to be afforded any lead-in time during which it enjoys better processes and procedures as regards (a) to (c) opposite or more generally.

### Viva

Viva expect that Batelco/BRE will have similar requirements to ourselves, including fit-for-purpose active products, dark fibre and duct access, as well as access to cable landing stations (CLS), such as Flag and GBI, at FRND and cost-based terms and conditions. If they do not, that suggests that Batelco/BRE is not acquiring the same services as OLOs under the RO, and so have no issue with the inadequate services in the RO.

As regards the SE’s proposed product set, the Authority refers Viva to the Authority’s comments in relation to Questions 3 and 4 above, regarding rationalisation of the existing draft RO product set, inclusion of additional products and treatment of international connectivity services.

The WDC Service Description has been amended to include, where appropriate, SDH and OTN services.

### Zain

The price and non-price terms of the SE draft RO have not materially changed from Batelco’s current RO. Zain is of the opinion that while the proposed draft RO includes wholesale inputs required to support the BRE product portfolio, it

The Authority refers Zain to the Authority’s comments in relation to Questions 3 and 4 above. The Authority has considered Zain’s requirements along with those of other Licensed Operators. The Authority has proposed revisions to the existing product set included in the draft RO,
will not suffice for OLOs. Furthermore, Zain’s proposed changes to the draft RO will also maintain wholesale inputs required to support the BRE product portfolio. As well as revisions to the price and non-price terms. Specifically, the Authority has proposed in the Draft Amended RO (a) reductions to the price terms for all those services that were included in the draft RO across the board, as well as (b) a number of additional non-price measures to guard against discrimination. Examples include: changes to certain terms in the definitions sections, the inclusion of an initial minimum set of requirements for monitoring of the provided services, improvement in the fault management process, improved minimum protection for MBS and DS, improvements to the Service Levels and associated Service Credits, restrictions on the SE to safeguard against the SE having direct contact with the OLO’s End User, changes to the speeds available for the WBS Service.

Comments received have been taken into consideration in the Draft Amended RO.

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<th>Etisalcom</th>
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<tbody>
<tr>
<td>No comments.</td>
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<tr>
<th>Infonas</th>
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<tr>
<td>• Assuming the TRA is referring to OLOs product portfolio rather than “support the Batelco Retail product portfolio”, Infonas does not find the draft RO to include all the wholesale inputs required to support its product portfolio.</td>
</tr>
<tr>
<td>The Authority refers Infonas to the Authority’s comments in relation to Questions 3 and 4 above. The Authority has considered Infonas’ requirements along with those of other Licensed Operators. The Authority has proposed revisions to the existing product set included in the draft RO,</td>
</tr>
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</table>
- Infonas repeats its comments regarding providing the US Government services based on DWDM/OTN Technologies and receiving requirements based on 100Gbps from customers such as Amazon Web Services – these are not available in any products listed in the draft RO.
- KPIs, SLAs, and monitoring points are also not included as inputs.

including rationalisation of the existing product set and the inclusion of additional products / services.

The WDC Service Description has been amended to include, where appropriate, SDH and OTN services.

In response to Infonas’ comments regarding US Government compliant equipment, the Authority has proposed wording in the MBS, WDC and DS Service Descriptions to ensure that OLOs will be able to choose CPEs from alternative vendors rather than a single vendor-specific Huawei solution.

The KPIs and Service Levels for the SE have been reviewed and amended in the Draft Amended RO. Improved Service Levels have been included. The Authority has also proposed enhanced monitoring requirements, which would require the SE to provide details, for example on at least the following parameters: (a) link availability; (b) bandwidth utilisation; (c) latency per circuit; (d) jitter per circuit; and (e) round trip delay per circuit (see Service Description for WDC, and for MBS). The relevant monitoring tool should be made available 24 hours a day, 7 days a week, 365 days a year.

NBN (Batelco)

NBN will work with BRE/other OLOs to deliver appropriate wholesale inputs for retail service offerings. It will focus on the high-speed broadband service offering – not all of the retail service stack relies on NBN inputs. NBN will work in partnership with all OLOs to determine the right services for the market place

The Authority welcomes NBN (Batelco)’s indication that it will continue to work with OLOs on product development. It is important that NBN (Batelco) ensures that the product set offered is fit for purpose and meets OLOs’ current and future requirements.
| and map the competing needs of investment, innovation, retail competition and efficiency. | The Authority has proposed in the Draft RO Order the mandatory establishment of an industry forum that will enable OLOs to communicate their needs and requirements to NBN (Batelco) (the SE) on an ongoing basis. This would be alongside (i.e., in addition) to OLOs’ (Access Seekers’) ability to request the introduction of new / amended RO Services at any time under the Draft Amended RO. The Authority points out that it is in the SE’s interest to ensure that there is maximum take-up of products / services. |

Question 7: Do you consider the draft RO is in line with transitioning to the principles set out in the NERF? |

| BRE (Batelco) | BRE (Batelco)’s comments are noted. The Authority does not consider that BRE’s comments require the Authority to change its proposed position. |

| BRE (Batelco) | BRE believes there will be a gradual evolution towards fulfilling the NERF principles (due to the nature of the implementation process and the interdependencies of the separation project). |

| Viva | The NERF suffers from many of the flaws highlighted in Viva’s wider submissions; including that SE will only provide active services (it must also |

<p>| Viva | The Authority notes Viva’s comments and refers Viva to the Authority’s comments in response to Questions 3 and 4 above. The Authority refers |</p>
<table>
<thead>
<tr>
<th><strong>Zain</strong></th>
</tr>
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<tbody>
<tr>
<td>The draft RO in its current form does not transition seamlessly to the principles set out in the NERF (in particular, the three main objectives set out in section 10 of the Report on NERF).</td>
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<th><strong>The Authority</strong></th>
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| The Authority notes Zain's comment, but it is unclear from Zain's response how Zain considers that the draft RO does not transition seamlessly to the principles set out in the NERF (which are to: (i) Promote Efficiency; (ii) | in particular, to the Authority's proposed inclusion of additional products/services, including FAS, within the draft RO.

The Authority disagrees with Viva's comment that EOI is only a requirement in the "long run". The Authority has proposed that EOI could be approached on a service-by-service basis, addressing EOI for those services which OLOs will most likely need on a priority basis to be able to service existing customers. The Authority has suggested timelines in the Draft RO Order for each of the services in the Draft Amended RO. The Authority invites specific feedback on the proposed approach to EOI for such services, including the suggested prioritisation of services, as well as the proposed timelines for each.

For completeness, the Authority notes the inclusion of specific wording in the draft Amended SE License (see the Authority’s consultation LAD/0219/055) which indicates that the Authority considers the SE will be required to achieve full EOI within twenty-four (24) months after launch, unless the Authority determines otherwise.

As regards Viva's comments regarding services-based competition versus infrastructure competition, the Authority refers Viva to the objectives of NTP4.
<table>
<thead>
<tr>
<th>Etisalcom</th>
<th>Promote Competition; and (iii) Promote investment in fibre-based NBN, as outlined in section 10 (page 86 onwards).</th>
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<tbody>
<tr>
<td>Yes.</td>
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<th>Infonas</th>
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| Infonas does not believe that the draft RO is in line with transitioning to the principles set out in the NERF. The RO does not offer the right products and services to ensure downstream operators (Infonas in this instance) to be able to compete effectively or meet the current or future needs of Licensed Operators (as per comments re: Amazon web services). |

| The Authority notes Infonas’ comments. The Authority refers Infonas to the Authority’s comments in response to Questions 3 and 4 above. The Authority has proposed revisions to the existing product set included in the draft RO, including rationalisation of the existing product set and the inclusion of additional products / services. |

| Infonas repeats its concerns re: the SE’s use of US Navy non-compliant equipment (Huawei technologies). |

| In response to Infonas’ comments regarding US Government compliant equipment, the Authority has proposed wording in the MBS, WDC and DS Service Descriptions to ensure that OLOs will be able to choose CPEs from alternative vendors rather than a single vendor-specific Huawei solution. |

| Accordingly, the lack of appropriate products does not provide Infonas a “menu of wholesale products to choose from, which can be combined according to their individual and reasonable requirements, therefore creating the basis for a “level playing field” and effective service-based competition” as set out in the NERF. In fact, the lack of such products may very well lead to Infonas losing and/or a breach by current customer (Infonas had already lost a business opportunity due to the lack of an available 100 Gbps service). |

| In terms of Infonas’ comments regarding the need for higher speed services, the Authority has included in the revised RO provision for services up to 100Gbps. |

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NBN (Batelco)

NBN continues to ensure that the principles in the NERF are adhered to as this transitional RO develops. NBN will work closely with the TRA, OLOs and government as well as wider stakeholders to drive the national agenda as set out in the NERF and the specific goals of the NTP4.

NBN (Batelco)'s comments are noted.

Question 8: Please provide comments on any other areas of concern you have regarding any of the product descriptions included in the draft.

BRE (Batelco)

BRE’s comments on other areas of concern regarding the product descriptions:

1. Section 3.1 of the WDC and WLA Service Descriptions: change the frequency period of supplying the SE with a non-binding forecast to six months instead of every month.
2. WLA service description: have WLA service speed of 512Kbps to 2Mbps be preferentially provided on fiber where there exists a dual copper and fiber access on a given site.
3. There are references to “Batelco” in the WDC service description where the reference should be “Separated Entity” or “SE”.
4. BRE supports tariffs and offerings for open period contracts for the leased circuit products and not just fixed periods between the SE and licensed operators (including BRE).

Comments have been taken into account in the Draft Amended RO.

The Authority has considered BRE (Batelco)'s comments regarding frequency of forecasting. The Authority has merged WLA with WDC. The following refers to the merged WDC Service Description.

1. The Authority has proposed amendments to the frequency period from one month to three (3) months i.e., every quarter. The Authority considers that quarterly forecasting is appropriate for both OLOs and the SE and represents a balanced approach to ensuring that OLOs provide sufficient visibility of their
requirements to enable the SE to plan resources, while OLOs are not burdened with monthly forecasting.

2. The Draft Amended RO includes a range of speeds for the new merged WDC Service. The WDC Service is technology agnostic and depending on the availability of fibre and the speed required, the SE can determine the technical solution to meet the service request.

3. BRE (Batelco)'s comment is noted. The Authority agrees that the RO should refer to the Separated Entity / SE and not to Batelco.

4. BRE (Batelco)'s comment is noted. In its review of the draft Reference Offer the Authority has proposed the following:

   (a) The WDC Service will have a 12 month minimum service period.

   (b) The MBS and DS Services will each have a 24 month minimum service period.

   (c) The Authority proposes that there is no minimum service period for the WBS Service. This is because the WBS Service is a wholesale service provided to support a competitive mass market service and therefore it would not be appropriate to restrict End Users being able to exercise their right(s) to move service provider, which would be the case should a minimum service period be required by the SE for Licensed Operators (Access Seekers) purchasing WBS Services.
<table>
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<th><strong>Etisalcom</strong></th>
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| **WBS Service Description:** Point 3.1 states that "Access Seeker shall ensure that WBS is not subdivided or split between multiple end users premises." Etisalcom opposes this as it will unnecessarily increase infrastructure cost; e.g. in case of Serviced Apartments where the internet services are part of the rent and the landlord normally manages the internet in the whole building or a business organisation split over several branches/locations - it is unnecessary that the landlord/business will take individual connections for each apartment/branch. This should be in accordance with customer preference, so there should be no such restriction.  

**Point 3.2:** states that 12 month is the minimum service period per connection for the WBS Service. Etisalcom is of the view that it should be possible to terminate with one month notice as customers often change residences or offices and this becomes an unnecessary nuisance. Furthermore, if the customer is not happy with existing service provider, this will enable the customer to change the service provider.  

The Authority has considered Etisalcom's comments regarding the purported prohibition on sub-division / splitting of the WBS Service. The Authority understands that a single WBS Service is provided to the CPE and it is not appropriate for the Service to be split. Other comments have been taken into account in the Draft Amended RO.  

As regards:  
- **Point 3.1,** Etisalcom's comment is noted. The Authority has not proposed removing the restriction on subdivision or splitting between multiple end user premises. See above reasoning.  
- **Point 3.2,** Etisalcom's comment is noted. The Authority proposes that there is no minimum service period for the WBS Service. This is because the WBS Service is a wholesale
With 12 month restriction, customers usually feel bound by their existing service providers.

- **Point 4.5**: Multiple VLANs and Multicasting should be included at some point as technology is evolving and IoT services are being introduced, these will best be managed through Multiple VLANs and Multicasting.

- **Point 8.3**: Etisalcom does not understand why the end user consent is necessary when access seeker is responsible for everything. This end user requirement should not be there to ensure secrecy of client and to make sure no such information is passed or leaked from SE to BRE.

- WSDSL services: this should not be part of the SE because it carries managed services and it also requires IP transit to provide the services. Furthermore, OLOs need to be resell the services to other small OLOs.

- DS should be available for OLOs, and not just MNOs as OLOs also maintain different nodes to provide services and transmission of all types of traffic on OLO network.

Service provided to support a competitive mass market service and therefore it would not be appropriate to restrict End Users being able to exercise their right(s) to move service provider, which would be the case should a minimum service period be required by the SE for Licensed Operators (Access Seekers) purchasing WBS Services.

- **Point 4.5**, Etisalcom’s comment is noted. The Authority has not proposed multiple VLANs and/or multicasting at this time. However, the Authority believes this could be considered as part of future review of the Reference Offer.

- **Point 8.3**, Etisalcom’s comment is noted. The Authority has proposed that the SE’s involvement in the Access Seeker’s relationship with the End User is removed and has amended the relevant Service Description accordingly to prevent this from being the case.

- The Authority notes Etisalcom’s comment regarding WSDSL. The Authority has proposed in the Draft Amended RO that WSDSL should not be offered by the SE, but should continue to be offered by Batelco Retail (BRE).

- As regards Etisalcom’s comments on DS, the Authority has proposed that this Service is available to MNOs. At this time, the Authority does not consider that the service needs to be extended to non-MNOs. This is because DS has been designed as a mobile backhaul service. The WDC Service provides for full connectivity for non-MNOs.
There is confusion in the product description for WDC product, in that:

- The WDC service description is explained in Annex 1 and Annex 5 of the product description documents (in the draft RO) as: Ethernet service point-to-point or Ethernet point-to-multipoint; and the service attributes listed are all related to Ethernet (Layer 2) such as MAC address, VLAN, and etc. At the same time, it is mentioned that optical access includes OTU2 and SDH (STM16/STM64) which is Layer 1/1.5 technologies. This is technically not possible, as Layer 1/1.5 technologies cannot ride over Layer 2 Ethernet network. Therefore, for example STM64/OTU2 cannot ride over Ethernet.

- When Infonas established a WDC NNI with Batelco in 2017, Infonas has asked for STM16 and STM64 over WDC but it did not receive a proposal because it was told by Batelco that WDC support Ethernet only, and Batelco seemed also to be confused about the same. Infonas has email communication showing this confusion with no response from Batelco till date.

- Infonas' point is that if SDH and OTN services are supported under WDC product, then the WDC product description needs to be changed to be to reflect the same. But, if SDH and OTN services are not supported under WDC product then there must be a new product that offer the missing L1 services.

Infonas also sees limitations on the product description for WDC product, in that:

- The Authority does not understand Infonas' claimed confusion regarding Annex 1 and Annex 5 of the WDC Service Description in the draft RO. The Authority considers that both Layer 1/1.5 and 2 services can be made available not that Layer 1 services are carried over Layer 2 link.

The Authority considers that the revised RO Services Descriptions in the Draft Amended RO should address a number of the issues raised.

- As regards SDH and OTN, the Authority has included in the revised RO provision for SDH and OTN services. The Authority considers that the revised Service Descriptions in the Draft Amended RO takes into account requirements for speeds and has included SDH based services. The Technical Annex for the relevant WDC Service provides an overview of the list Service Attributes. A more detailed technical description can be included in the Joint Working Manual that should set out all of the technical solutions possible.

- The Service Description for the WDC Service has been amended to include speeds up to 100 Gbps.

- The Authority has proposed additional products and services in the Draft Amended RO product set, including OWS.
- The product is limited to 10Gbps, resulting in a capacity limitation which ultimately prohibits Infonas from competing or meeting current customer requirements.
- The product description is lacking the option to have a clear wavelength connectivity.

**NBN (Batelco)**

N/A – question for OLOs.

**Question 9:** Do you agree with the Authority's proposals not to require the SE to include passive access products in its RO at this time, as set out at paragraphs 6.10 to 6.13 of the Consultation document? If not, please set out why.

**BRE (Batelco)**

Based on the assumption this is a transitional process and the RO/other project dependencies still exist, BRE believes that passive access product offerings are not a mandatory requirement.

The Authority has considered comments received from Licensed Operators regarding the SE’s product set, and specifically Licensed Operators’ views on the provision of passive access products within the current product set.

The Authority has proposed the inclusion of two additional services into the Draft Amended RO, namely:
- Optical Wavelength Access Service (OWS) which is a new optical wavelength based active service (Lambda service); and
- Fronthaul Access Service (FAS) for MNOs, which is a dark fibre product, limited to point to point connectivity between the Baseband Unit and the Remote Radio Head of the Network.

The Authority has not proposed the inclusion of dark fibre product for backhaul at this stage. As noted above however, the Authority proposes to conduct a review of the initial RO within the first eighteen (18) months of its publication. As part of the Authority’s review, the Authority will consider, among other matters, whether the SE should be required to make dark fibre available for backhaul. In so doing the Authority would take into account the technical requirements of OLOs, based on recognised industry standards, the state of provision of the SE’s active service portfolio and any comparative active products.

<table>
<thead>
<tr>
<th>Viva</th>
</tr>
</thead>
<tbody>
<tr>
<td>No – Viva believes that the TRA has misapplied the Law in this respect (see section 5 of the Viva Submissions at Appendix 1 of this Consultation Report).</td>
</tr>
</tbody>
</table>

Please see the Authority’s comments above. The Authority disagrees with Viva’s views that the Authority has misapplied the Law. Viva’s interpretation that a dark fibre product for both fronthaul and backhaul is mandated, at this time, is incorrect.

The Authority will however continue to review the position, including as part of the Authority’s proposed review of the RO within the first eighteen (18) months of its publication.

As part of the Authority’s review, the Authority will consider, among other matters, whether the SE should be required to make dark fibre available
for backhaul. In so doing the Authority would take into account the technical requirements of OLOs, based on recognised industry standards, the state of provision of the SE’s active service portfolio and any comparative active products.

In terms of specific comments raised by Viva, the Authority highlights the following. The below is not an exhaustive list of responses to each point raised by Viva in its Appendix 1. The Authority has focused on what it understands to be the salient points regarding this particular Question:

- The Authority does not agree with Viva’s stated legal basis for the mandatory provision of dark fibre access and Viva’s interpretation of Article 57(e) of the Telecommunications Law (the “Law”).
- Article 57(e) of the Law requires that a “Public Telecommunications Operator in a Dominant Position shall offer upon request Access to its Telecommunications Network on fair and reasonable terms to any Licensed Operator” (emphasis added). Accordingly, a pre-requisite to any obligation to offer Access (as defined under the Law) is that the Public Telecommunications Operator in question be determined as Dominant. The position in Article 57(e) of the Law is consistent with that in Article 2.1 of the Access Regulation.
- The Authority notes that Article 57(b) refers to interconnection, not to Access, and therefore is not relevant to the current issue.
- This means that until the SE is formally determined Dominant, it would not be mandatory to provide Access to its Telecommunications Network under Article 57 of the Law.
- Notwithstanding the above, and in order to avoid a regulatory lacuna in the absence of a formal market review and finding of dominance, the Authority has proposed however an explicit obligation on the SE (by way of the draft Amended SE License) to
publish a reference offer, and for such reference offer (the Draft Amended RO) to include OWS and FAS products.

- As noted above, the Authority is not proposing dark fibre for backhaul at this time. The Authority understands from the formal submissions received to this present (first) consultation on the draft RO that MNOs do not require specific connectivity solutions to address their 5G requirements within this coming RO. This view is supported by the technical reports submitted to the Authority, which confirm that dark fibre access for the purposes of roll-out of 5G is not an immediate requirement, specifically for backhaul.

- The Authority will continue to consider this position as part of the Authority’s review of the initial RO.

- As regards Viva’s reference to benchmark of countries where dark fibre access products have been made available, the Authority welcomes such information. However, it needs to be noted that the Authority has assessed the merits of dark fibre in Bahrain given the requirements of MNOs, based on recognised industry standards.

- The Authority notes Viva’s reference to emergence of WDM-based PON technologies. While interesting, Viva does not provide a clear reason for introducing this topic at this point nor how it relates to the SE RO. Notwithstanding this, the Authority notes that it has not considered using PON based technologies to deliver fronthaul. Furthermore, with respect to the provision of broadband services, the SE’s draft RO provides bitstream solutions (not WDM-based PON technologies) for allowing access over the SE’s GPON network.
The reference to "passive access products" is broad and generic. It is essential to define what applications and portion of network connectivity passive elements are to be considered as pre-requisites for the service delivery of current and future retail products (e.g. C-RAN, CU, DU, RRH, CPRI – see comments/explanation of these on pages 9-12 of Zain’s Submissions at Appendix 2 of this Consultation Report).

The Authority has considered in the Draft Amended RO the issues raised by Zain, especially in terms of connectivity requirements of certain portions of the network, and the Authority has proposed changes to the Draft Amended RO as set out below.

Specifically, the Authority has proposed the inclusion of two additional services into the Draft Amended RO, namely:

- Optical Wavelength Access Service (OWS) which is a new optical wavelength based active service (Lambda service); and
- Fronthaul Access Service (FAS) for MNOs, which is a dark fibre product, limited to point to point connectivity between the Baseband Unit and the Remote Radio Head of the Network.

The Authority is not proposing dark fibre for backhaul at this time. The Authority understands from the formal submissions received to this present (first) consultation on the draft RO that MNOs do not require specific connectivity solutions to address their 5G requirements within this coming RO. This view is supported by the technical reports submitted to the Authority, which confirm that dark fibre access for the purposes of roll-out of 5G is not an immediate requirement, specifically for backhaul.

The Authority will continue to consider this position as part of the Authority’s review of the initial RO.
| Etisalcom strongly urges that passive access products are included in the RO as soon as possible and a definitive timeline should be defined for this. |
| The Authority notes Etisalcom’s comments. The Authority has proposed the inclusion of two additional services into the Draft Amended RO, namely: |
| • Optical Wavelength Access Service (OWS) which is a new optical wavelength based active service (Lambda service); and |
| • Fronthaul Access Service (FAS) for MNOs, which is a dark fibre product, limited to point to point connectivity between the Baseband Unit and the Remote Radio Head of the Network. |

<table>
<thead>
<tr>
<th><strong>Infonas</strong></th>
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<tbody>
<tr>
<td><strong>Infonas</strong> seeks clarity in respect of the future of its dark fibre network (especially as the Consultation Paper has set a timeframe of up to two years for the SE to be able to provide all NBN wholesale services on a true equivalence of inputs basis).</td>
</tr>
<tr>
<td><strong>Paragraph 6.12 of the RO:</strong> Infonas is concerned that such restriction will continue to affect its ability to meet its customers’ requirements as set out in response to question 2. 5 and 7.</td>
</tr>
<tr>
<td><strong>Paragraph 6.12:</strong> this may lead to limitations in securing new business or meeting customer demands. New requirements or products have been allocated for nor given a proper channel to be requested.</td>
</tr>
<tr>
<td>The Authority considers that any requirement to require Licensed Operators to migrate and/or decommission their existing fibre assets will depend on several factors, including the suitability of the SE’s active product set.</td>
</tr>
<tr>
<td>As indicated in the Authority’s first consultation document on the SE’s initial draft RO, the Authority will continue to review the SE’s RO including the possible inclusion of a dark fibre product for backhaul.</td>
</tr>
<tr>
<td>The Authority maintains its view that requiring the SE to offer additional duct rental services at this time may compromise the transition to the new industry structure and would be inconsistent with NTP4’s single network objective.</td>
</tr>
</tbody>
</table>
NBN (Batelco)

- NBN supports the Authority’s proposal not to require the provision of passive products at this time. NBN expects the TRA to pay utmost regard to the cyber-security needs of the Kingdom in considering any change to that proposal (see part IV of the NTP4).

- From an economic perspective, the prohibition on the provision of passive access is entirely consistent with government policy as set out in NTP4. In addition, NBN notes that there has been no market review identifying market failure for which passive products might be an appropriate regulatory remedy.

- NBN further notes that, internationally, where duct access has been mandated, it has been mandated in order to drive policies aimed at competing, and often overlapping, fibre build (e.g. in the UK). This is not the position in Bahrain where NTP4 and the wider law mandates the creation of a single fibre based national broadband network. The provision of duct access on a mandated basis would likely cut across this primary objective. NBN also notes the TRA accepts this principle (see paragraph 112 of the NERF).

- NBN notes that it is the intention of NTP4 that NBN should be entitled to recover efficiently incurred costs including a fair return on its investment. NTP4 and thus the economic model for NBN are based on the provision of active services and the returns that can be earned from those products. The introduction of dark fibre as a mandated remedy could dramatically affect those plans and NBN’s ability to earn returns on its investment. This could jeopardise NBN’s ability to meet its fundamental remit, which is to develop the single network infrastructure for Bahrain and to meet the relevant deployment targets for the

The Authority notes NBN (Batelco)’s comments. The Authority refers NBN (Batelco) to the Authority’s comments regarding Questions 3 and 4 above. The Authority disagrees with NBN (Batelco)’s interpretation of NTP4 and the NERF, and specifically with NBN (Batelco)’s statement that provision of passive access is (or should be) prohibited.

The Authority notes that it has proposed the inclusion of two additional services into the Draft Amended RO, namely:

- Optical Wavelength Access Service (OWS) which is a new optical wavelength based active service (Lambda service); and
- Fronthaul Access Service (FAS) for MNOs, which is a dark fibre product, limited to point to point connectivity between the Baseband Unit and the Remote Radio Head of the Network.

The Authority is not proposing at this time, to require the SE to provide a dark fibre product for backhaul. However, the Authority will continue to review this position going forward, including as part of the Authority’s proposed review of the RO within the first eighteen (18) months of its publication.

In so doing the Authority would take into account the technical requirements of OLOs, based on recognised industry standards, the state of provision of the SE’s active service portfolio and any comparative active products.

The Authority notes NBN (Batelco)’s reference to the position in the UK. However, NBN (Batelco) fails to observe that Ofcom’s position is driven by
Kingdom.

- As such, a request for dark fibre, which could materially impact the delivery of NTP4, would need to be supported on clear grounds as to why this was needed, an exceptionally clear determination of the market failure that was sought to be addressed, and why such a remedy was the most appropriate means of addressing that failure as opposed to other product offerings. NBN always remains open to these dialogues but notes the key issues that would need to be addressed.

its position regarding duct and pole access (which forms the basis of a discrete Ofcom consultation), and reflects the specific policy of objectives of Ofcom.

The Authority also notes NBN (Batelco)’s comments regarding recovery of efficiently incurred costs, and its indication that any dark fibre remedy would need to be considered within the overall context of NBN (Batelco)’s ability to earn returns on its investment. Should the Authority determine that a dark fibre product for backhaul should be introduced in subsequent Reference Offers it will consider, at that time, how such a product should be priced, taking into account the four principles set out in the Consultation Document and which, for the avoidance of doubt, require the Authority to consider the financial viability of the SE.

The Authority is not proposing to include specific price terms for FAS within the draft RO. The Authority has noted in the ROO Consultation that there could be two (2) options with regard to provision of FAS: (1) FAS is provided by the SE to Licensed Operators; (2) Licensed Operators are able to self-provide (i.e., deploy) fibre (using SE-approved contractors). Under this second option, Licensed Operators could be required to transfer this fibre to the SE. MNOs would not be required to pay a MRC but, in the event that it is decided that the SE should be responsible for maintenance of the fibre, Licensed Operators might be required to pay for maintenance. As such, the Authority considers that the provision of FAS on such terms does not compromise / detrimentally impact the SE’s ability to earn a return.

Question 10: If you do not agree with the Authority’s proposals on passive products at this time, please provide specific details including the impact on your business, and services. Please substantiate and quantify your position with supporting evidence.
<table>
<thead>
<tr>
<th>Company</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>BRE (Batelco)</td>
<td>No comments.</td>
</tr>
<tr>
<td>Viva</td>
<td>Viva sets out its views on this topic in detail in section 5 in the main body of the Viva Submissions (see Appendix 1 of this Consultation Report). Please see above comments in response to Question 9.</td>
</tr>
<tr>
<td>Zain</td>
<td>See comments/explanation of these on pages 9-12 of Zain’s Submissions at Appendix 2 of this Consultation Report. Please see above comments in response to Question 9.</td>
</tr>
<tr>
<td>Etisalcom</td>
<td>Dark fiber and Duct rentals should be included as soon as possible and a definitive timeline should be defined for this. Please see above comments in response to Question 9.</td>
</tr>
<tr>
<td>Infonas</td>
<td></td>
</tr>
<tr>
<td><strong>NBN (Batelco)</strong></td>
<td></td>
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<tr>
<td>-------------------</td>
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<tr>
<td>NBN agrees with the Authority's proposals.</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>BRE (Batelco)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>BRE submits that if dark fibre is offered as a remedy then the following factors should also be taken into account:</td>
</tr>
<tr>
<td>- Economic – is there a market failure still needing to be addressed? Do the benefits outweigh the costs?</td>
</tr>
<tr>
<td>- Is service competition adversely affected by the SE not offering dark fibre?</td>
</tr>
</tbody>
</table>

Please see above comments in response to Questions 3, 4 and 9. The Authority has, in the Draft Amended RO, taken into account requests for access to meet customer requirements such as US Government requirements. In addition the Authority has proposed wording in the MBS, WDC and DS Service Descriptions to ensure that OLOs will be able to choose CPEs from alternative vendors rather than a single vendor-specific Huawei solution.

**Question 11:** Given the Authority's proposed approach in paragraph 6.13 of the Consultation document, what, if any, other factors should the Authority take into account when examining whether dark fibre should be included in the SE RO in the future?

The Authority notes BRE's comments. The Authority broadly agrees with the factors listed by BRE. However, it is unclear from BRE's comments the relevance of cyber security factors as regards provision of dark fibre and how BRE proposes that such factors should be assessed in this context. The Authority notes that BRE does not appear to have provided international benchmarks regarding assessment of cyber security factors for the provision of a dark fibre remedy.
- Financial sustainability of the SE (for example, would dark fibre provision adversely affect the SE's ability to cover its costs and/or make a reasonable return on its investment?);
- Efficiency of the SE (i.e. the ability to respond to and repair faults if dark fibre was offered);
- Other relevant factors – e.g. physical/cyber security of the single national network and overall Government policy in the National Telecommunications Plan.

**Viva**

Please see section 5 of the Viva Submissions (in Appendix 1 of this Consultation Report). The TRA does not have the discretion to decide not to include dark fibre in the SE RO. It is a form of Access, which an AS may seek under the Law.

The Authority disagrees with Viva's interpretation of the Authority's powers in this regard. Please see above comments in response to Question 9.

**Zain**

See Zain's comments/explanation of these on pages 9-12 of Zain's Submissions at Appendix 2 of this Consultation Report.

Please see above comments in response to Question 9.

**Etisalcom**

Please see above comments in response to Question 9.
Please provide a proper timeline about the availability of dark fiber and duct rentals. This needs to be done as soon as possible as DS is still not offered to OLOs, the only other option is to use the dark fiber for the connectivity of OLO's different nodes.

As noted above, the Authority has proposed the inclusion of two additional services into the Draft Amended RO, namely:

- Optical Wavelength Access Service (OWS) which is a new optical wavelength based active service (Lambda service); and
- Fronthaul Access Service (FAS) for MNOs, which is a dark fibre product, limited to point to point connectivity between the Baseband Unit and the Remote Radio Head of the Network.

The Authority is not proposing at this time, to require the SE to provide a dark fibre product for backhaul. However the Authority will continue to review this position going forward, including as part of the Authority's proposed review of the RO within the first eighteen (18) months of its publication.

As part of the Authority's review, the Authority will consider, among other matters, whether the SE should be required to make dark fibre available for backhaul. In so doing the Authority would take into account the technical requirements of OLOs, based on recognised industry standards, the state of provision of the SE's active service portfolio and any comparative active products.

Infonas

Please see above comments in response to Question 9.
Until the SE is capable of providing sufficient dark fibre products meeting OLOs' requirements, dark fibre networks must remain with OLOs (see also answers to questions 2, 5, 7 and 8).

The Authority refers Infonas to the Authority's first and second consultations on the draft SE License (LAD/1218/344 and LAD/0219/055) and to the Authority's consultation on the Authority's proposed amendments to Telecommunications Licenses held by the Licensed Operators other than the Bahrain Telecommunications Company BSC (Batelco) (the "OLOs") in light of the legal separation of Batelco (the "Amended Licenses") (LAD/0219/056).

Section 3.4 and section 3.6 of the draft Amended NFL License for OLOs (provided at Annex 1 to the Consultation on the Amended Licenses) proposes, among other matters, that OLOs should be allowed to maintain their own fibre assets / networks until such time as they are required to migrate and/or decommission their fibre assets under section 3.4 of the Amended NFL.

NBN (Batelco)

See NBN's response to question nine. In addition to cyber-security issues, there would need to be a number of very careful assessments made on market failure and the appropriate means of addressing this failure. This is presently not the case and NBN cannot see this in the foreseeable future, but NBN are happy to engage in dialogues at the appropriate time.

NBN (Batelco)'s comments are noted. However, the relevance of cyber security issues is unclear from NBN (Batelco)'s comments as regards provision of dark fibre and how NBN (Batelco) proposes that such factors should be assessed in this context. The Authority notes that NBN (Batelco) does not appear to have provided international benchmarks regarding assessment of cyber security factors for provision of a dark fibre remedy.

Notwithstanding the above, the Authority confirms that as part of its review of the initial RO, the Authority will consider, among other matters, whether the SE should be required to make dark fibre available for backhaul. In so doing the Authority would take into account the technical requirements of
Question 12: Do you agree that it is reasonable to require the SE to offer NBN wholesale products on an EOI basis within two years, as set out in paragraphs 6.14 and paragraph 6.4 of the Consultation document? If not, please set out an alternative timetable, alongside your reasoning.

BRE (Batelco)

A two year deadline should be the minimum and there should be provision to extend if there are reasonable grounds for doing so. The implementation of a successful EOI based separation in other jurisdictions (e.g. New Zealand and the UK) took more than two years; thus the emphasis should be on the importance of achieving the desired end result of NTP4 through the most effective and dependable means.

The Authority disagrees with BRE (Batelco)'s view that two (2) year deadline should be the minimum. While the Authority recognises that the introduction of EOI impacts on many processes and systems of the SE, the Authority considers that a twenty-four (24) month timeline for full EOI across all products and services is appropriate.

Further, the Authority considers that there will be benefits in prioritising the implementation of EOI on a service basis as well as potentially on an individual process basis.

The Authority considers that a process and systems audit will need to be conducted in order to identify the individual steps needed to reach EOI. The Authority therefore has included in the Draft RO Order provisions that provide for the Authority to appoint an independent auditor, to conduct an audit of the SE’s systems and processes, and to produce an audit report within six (6) months from the date of the final Reference Offer Order. The costs of the auditor would be borne by the SE.

The Authority has set out in the Draft RO Order proposed timelines for full EOI for individual products and services, which are to be met from the date...
of completion of the audit. This means that full EOI for certain services that were the subject of the Consultation Document can be available ahead of twenty-four (24) months.

In addition, the Authority has proposed in the second public consultation on the draft SE License (LAD/0219/055) published on 28 February 2019 and specifically in section 4.11 and 4.12 of the Amended SE License timeframes for the logical and physical separation of the SE’s Management Information Systems, Business Support Systems and Operational Support Systems.

The Authority further considers that it is important for the SE to ensure that the same portal is available to all parties who wish to take services from the SE.

The Authority has proposed in section 5.4 of the Amended SE License that a single common interface for OLOs (i.e., such that OLOs and BRE would have access to the same system) to order and track the progress of orders should be made available from day one.

### Viva

<table>
<thead>
<tr>
<th>No. Please see section 3 of the Viva Submissions for Viva’s views on this topic (Appendix 1 of this Consultation Report).</th>
<th>Viva’s comments are noted.</th>
</tr>
</thead>
<tbody>
<tr>
<td>The introduction of EOI impacts on many processes and systems of the SE. The Authority considers that a twenty-four (24) month timeline for full EOI across all products and services is appropriate.</td>
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The Authority considers it is important for the SE to ensure that the same portal is available to all parties who wish to take services from the SE.

The Authority has proposed in section 5.4 of the Amended SE License that a single common interface for OLOs (i.e., such that OLOs and BRE would have access to the same system) to order and track the progress of orders should be made available from day one.
No. Based on Zain’s experience with Batelco wholesale products (which Zain has a record of complaints in respect of), achieving a level playing field is highly doubtful unless EoI migration is mandated sooner. The most recent experience with the service order was to place the Transitional Data Services (“TDS”), by which (110) TDS applications were placed in November 2018, to connect Zain’s radio base stations. However:

- In December 2018, Batelco responded that only a single site has fibre connectivity, and quoted BD 76,700 to connect (48) sites.
- Based on the fact that more than of 18 sites from these applications are already connected sites using Batelco’s active leased circuits, a meeting was held with Batelco to review their response.
- Subsequently, 35 applications were confirmed and furthermore 12 applications were also confirmed (Zain are still in discussions about the remaining applications). To the best of Zain’s knowledge, it is aware that they are other sites that are already connected; for the remaining unconnected sites, connecting them would cost less than three MRC.

International best practice indicates that in other markets, products were delivered on an EoI basis sooner than within a 2-year timeline. Furthermore, Zain has set out its position that the SE should provide the equivalent processes at a minimum for: (i) service ordering and provisioning; (ii) fault management; and (iii) access to infrastructure information.

The introduction of EoI impacts on many processes and systems of the SE. The Authority considers that a twenty-four (24) month timeline for full EoI across all products and services is appropriate.

It is recognised however, that there will be benefits in prioritising the implementation of EoI on a service basis as well as potentially on an individual process basis.

The Authority considers that a process and systems audit will need to be conducted in order to identify the individual steps needed to reach EoI. The Authority therefore has included in the Draft RO Order provisions that provide for the Authority to appoint an independent auditor, to conduct an audit of the SE’s systems and processes, and to produce an audit report within six (6) months from the date of the final Reference Offer Order. The costs of the auditor would be borne by the SE.

The Authority has set out in the Draft RO Order proposed timelines for full EoI for individual products and services, which are to be met from the date of completion of the audit. This means that full EoI for certain services that were the subject of the Consultation Document can be available ahead of twenty-four (24) months.

In addition, the Authority has proposed in the second public consultation on the draft SE License (LAD/0219/055) published on 28 February 2019 and specifically in section 4.11 and 4.12 of the Amended SE License timeframes for the logical and physical separation of the SE’s Management Information Systems, Business Support Systems and Operational Support Systems.
The Authority agrees that it is important for the SE to ensure that the same portal is available to all parties who wish to take services from the SE.

The Authority has proposed in section 5.4 of the Amended SE License that a single common interface for OLOs (i.e., such that OLOs and BRE would have access to the same system) to order and track the progress of orders should be made available from day one.

<table>
<thead>
<tr>
<th>Etisalcom</th>
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<tbody>
<tr>
<td>No comments.</td>
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</table>

<table>
<thead>
<tr>
<th>Infonas</th>
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</thead>
<tbody>
<tr>
<td>Infonas does not agree with the contents of paragraph 6.4 and 6.14 of the Consultation paper — there is a lack of visibility as to when each product/service will be provided on an EOI basis. Also, Infonas is fearful that during such timeframe OLOs will not be able to compete on a &quot;level playing field&quot; in the telecommunications market. Infonas seeks guarantees that OLOs will not have degraded services/ SLAs during such timeframe.</td>
</tr>
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</table>

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| The introduction of EOI impacts on many processes and systems of the SE. The Authority considers that a twenty-four (24) month timeline for full EOI across all products and services is appropriate. |

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The Authority has set out in the Draft RO Order proposed timelines for full EOI for individual products and services, which are to be met from the date of completion of the audit. This means that full EOI for certain services that were the subject of the Consultation Document can be available ahead of twenty-four (24) months.

In addition, the Authority has proposed in the second public consultation on the draft SE License (LAD/0219/055) published on 28 February 2019 and specifically in section 4.11 and 4.12 of the Amended SE License timeframes for the logical and physical separation of the SE’s Management Information Systems, Business Support Systems and Operational Support Systems.

The Authority considers it is important for the SE to ensure that the same portal is available to all parties who wish to take services from the SE.

The Authority has proposed in section 5.4 of the Amended SE License that a single common interface for OLOs (i.e., such that OLOs and BRE would have access to the same system) to order and track the progress of orders should be made available from day one.

The Authority has also clarified in section 5.4 of the Amended SE License that EOI should be the default. This means that even within the initial twenty-four (24) month period from award of the License, the SE will be required to deliver the Licensed Services on an EOI basis, unless otherwise determined by the Authority. During the initial twenty-four (24)
NBN (Batelco)

- The difficulties of the transition to EOI should not be underestimated in particular as regards system separation and the delivery of full EOI.
- International cases (i.e. BT in the UK and Singapore OSS/BSS separation) shows that the creation of new systems and separate systems has been hugely costly and that a focus on an unduly tight timescale encourages failure and diverts scarce system resource away from product development and service quality.
- However, NBN aims to work to the fastest possible timeframe. The aim is to ensure the most effective allocation of resources and critically so NBN can deliver up the goals of the NTP4, including deployment targets. There are also clear incentives on NBN to secure these targets and NBN discuss below some additional models here.
- Where EOI is not achievable, NBN is committed to securing EOO. This will focus on the core elements of service delivery and price. It is NBN’s goal to ensure that EOO, where required, is only in place for the shortest time possible and, where economically feasible, will move rapidly to EOI.
- The international precedents above signal that trade-offs will

month period and absent providing certain services on an EOI basis, the SE will in any event be required to provide the Licensed Services on an EOO basis.

As regards Infonas’ comments on SLAs, the Authority notes that a new SLA Schedule has been introduced into the Draft Amended RO. The SLAs in this Schedule will apply to all Licensed Operators, meaning that the same SLAs apply to OLOs and to BRE.

NBN (Batelco)’s comments are noted. While the Authority recognises that the introduction of EOI impacts on many processes and systems of the SE, the Authority considers that a twenty-four (24) month timeline for full EOI across all products and services is appropriate.

The Authority notes NBN (Batelco)’s reference to examples in the UK and Singapore. However, it is not clear from NBN (Batelco)’s responses as to the suitability of these examples in the context of Bahrain, and as regards comparison with Batelco.

The TRA is considering the most effective way of ensuring that Eol is in place as soon as possible. Experience in other jurisdictions is that a process based or service based prioritisation can ensure that the benefits of Eol are realised as soon as can be achieved.

The Authority considers that there will be benefits in prioritising the implementation of EOI on a service basis as well as potentially on an individual process basis.
necessarily be required, but NBN will work closely with all parties to ensure that these do not impact on the achievement of the wider goals of NTP4.

- This overall process and transition period will require material levels of engagement between stakeholders and the TRA and NBN to evaluate the right outcomes, for example, focusing on specific key systems or product sets and appropriate phasing during the transition to EOI.

- Batelco and NBN have started making material steps to EOI, at the legal, functional and operational levels. These include the incorporation of the separate entity, redesigning and moving the wholesale function to NBN, and moving access staff to NBN. Dedicated programmes to deliver EOI and for the wider NBN programme and transparent reporting processes are being implemented.

The Authority considers that a process and systems audit will need to be conducted in order to identify the individual steps needed to reach EOI. The Authority therefore has included in the Draft RO Order provisions that provide for the Authority to appoint an independent auditor, to conduct an audit of the SE’s systems and processes, and to produce an audit report within six (6) months from the date of the final Reference Offer Order. The costs of the auditor would be borne by the SE.

The Authority has set out in the Draft RO Order proposed timelines for full EOI for individual products and services, which are to be met from the date of completion of the audit. This means that full EOI for certain services that were the subject of the Consultation Document can be available ahead of twenty-four (24) months.

In addition, the Authority has proposed in the second public consultation on the draft SE License (LAD/0219/055) published on 28 February 2019 and specifically in section 4.11 and 4.12 of the Amended SE License timeframes for the logical and physical separation of the SE’s Management Information Systems, Business Support Systems and Operational Support Systems.

The Authority further considers that it is important for the SE to ensure that the same portal is available to all parties who wish to take services from the SE.

The Authority has proposed in section 5.4 of the Amended SE License that a single common interface for OLOs (i.e., such that OLOs and BRE would have access to the same system) to order and track the progress of orders should be made available from day one.
The Authority notes NBN (Batelco)'s comment that the success of the introduction of EoI (and where necessary EoO) will require co-operation and co-ordination between all the stakeholders. In the Draft RO Order, the Authority has proposed the mandatory establishment of an industry forum, which is intended to ensure, among other matters, timely progress is made regarding EOI. The Authority intends to provide oversight to ensure that the process is managed to meet the requirements of all parties.

In addition, the Authority has proposed in the draft Amended SE License that part of the role of the Equivalence Compliance Committee (that is to be established by the TRA) will be to monitor and assess the SE’s compliance with its EOI obligation under the SE License.

**Question 13: Do you consider that the non-price terms, as set out in the schedules to the draft RO, including supply terms and definitions, are fit for purpose and meet the reasonable requirements of Licensed Operators?**

**BRE (Batelco)**

The RO in its entirety should be simplified. In reference to section 9.50 of the Final Award of Arbitration between Batelco and the Authority dated 30 October 2012 (which contained a statement about the clarity of the RO), BRE notes that, whilst there have been detailed changes made to service descriptions since October 2012, the rest of the Reference Offer remains largely unaltered. As the separation/equivalence project is implemented, then further major revisions can be made to the operational parts of the RO (for example, the Joint Working

The Authority recognises that major revisions will likely be required to the operational and technical documents that support the RO. The Authority will be requesting that the SE attend to this as a matter of priority and that a Joint Working Manual is developed as part of the mandated industry forum and made available within three (3) months from the date of the final Reference Offer Order.
<table>
<thead>
<tr>
<th><strong>Viva</strong></th>
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<tr>
<td>No. Viva has detailed the inadequacies in relation to the key non-price terms in section 6 and Annex 1 of the Viva Submissions (Appendix 1 of this Consultation Report).</td>
</tr>
<tr>
<td><strong>Zain</strong></td>
</tr>
<tr>
<td>The non-price terms, including supply terms and definitions, are not fit for purpose and do not meet the reasonable requirements of Licensed Operators. A recent outage of the Zain network which arose due to faults on a Batelco supplied link was sustained for over 12 hours due to Batelco’s unjustified delay in restoring the service (shows the challenges with the current RO non-price terms). The incident details were reported to the Authority as part of the Quality of Service Regulation obligation. Throughout the day, matters were escalated several times without an attendant response. When Batelco finally dispatched an engineer to the location, it took him less than an hour to identify the cable cut and rectify the issue (please refer to the detailed incident report relating to this for further information). In order to avoid such events in future, Zain is requesting a punitive measure of 200 x MRC compensation in the event of a default in meeting the SLA – the current rebate mechanism is mpt that is not proportionate to the damage caused by such default.</td>
</tr>
<tr>
<td><strong>Viva’s comments are noted. The Authority refers to its comments in relation to Question 6 above.</strong></td>
</tr>
<tr>
<td><strong>The KPIs, Service Levels and Penalties have been reviewed and amended in the Draft Amended RO. The Draft Amended RO also includes KPIs that allow both customers of the SE and the Authority to monitor performance. These can be used to target process improvement initiatives.</strong></td>
</tr>
<tr>
<td><strong>The Authority has considered Zain’s request for a ‘punitive’ measure of 200 x MRC compensation in the event of default in meeting SLAs. The Authority does not consider introduction of ‘punitive’ measures at this stage to be appropriate. However, the Authority has proposed that the current cap on the level of Service Credits that can be claimed for breach of SLAs would be removed. The Authority considers that there will inevitably be a start-up period post-launch of the RO. The Authority considers that it is in the interests of all Licensed Operators to ensure that the SE business is viable and its product set is fit for purpose.</strong></td>
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<tr>
<td>Entity</td>
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<td>--------------</td>
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<tr>
<td>Etisalcom</td>
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<tr>
<td>Infonas</td>
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<tr>
<td>NBN (Batelco)</td>
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</tbody>
</table>
In addition section 5.2 of the draft Amended SE License includes a specific requirement on the SE to reflect the reasonable requirements of Licensed Operators.

**Question 14:** Do you believe the price terms proposed by the Separated Entity for all the RO services reflect the principles set out in paragraph 6.1 of the Consultation document?

**BRE (Batelco)**

Yes.

BRE (Batelco)'s comments are noted. The Authority however has received comments from other stakeholders indicating that the SE's proposed prices are too high. The Authority has considered all comments received and is proposing a number of price reductions.

**Viva**

Viva is concerned that the TRA is not applying the requirements under the Law. Please see the price terms discussion in section 7 of the Viva Submissions (Appendix 1 of this Consultation Report).

Viva's comments are noted. As regards Viva's views on the application of Article 57(e) and Article 57(b) of the Law, the Authority refers Viva to its comments above under Question 9.

The relevant provisions in the Law concerning the SE's prices is Article 40(bis). This must be read alongside the provisions in the NERF concerning multi-year price controls. As noted however by the Authority in the consultation document, the SE might not be efficient from the outset.
but is expected to immediately start working towards enhancing its efficiency.

The Authority has noted the pricing benchmarks provided by Viva and has considered Viva’s view that the price levels proposed by the SE in the draft RO are not appropriate and should be reduced.

However, the Authority notes that any benchmarks should be considered with care and used alongside other sources of information to determine appropriate price terms, rather as the primary source.

For example, while the Authority recognises the broad thrust of Viva’s conclusions, namely that the benchmarks could suggest that the price terms in the draft RO may not be appropriate, it also believes there are a number of reasons why the “true” price differences between Viva’s benchmarked countries and Bahrain currently are not as significant as presented by Viva. For example, and with regards to the benchmarks of bitstream charges, it is not clear that all the benchmarks are provided on a basis consistent with the proposed SE draft RO. In particular, the New Zealand benchmark charge does not include transport costs, while the UK benchmark does not include the line rental charge that must also be paid in the UK.

Furthermore, when comparing benchmarks of bitstream prices it is important to not only consider a single price point but the full range of products offered. This is important in this case because a number of countries no longer have the set of products that the SE proposes to offer. That is, while the SE continues to provide a range of low speed products, other jurisdictions tend to focus on a small set of high speed broadband services. For example:

- NBN in Australia offers two packages – 50Mbps / 20Mbps (download / upload), and 100Mbps / 40Mbps; while
- Chorus in New Zealand offers only one bundle below 100Mbps: a package offering 30Mbps / 10Mbps (download / upload).
This implies that all broadband customers in those jurisdictions will be on one of those higher speed products, hence lowering the unit cost that operators incur for those services. In Bahrain, a large share of customers remain on low speed services, such as 10Mbps or below. Unit costs for higher speed services on the fibre network are likely to remain higher if a large share of customers remain on the copper network. The Authority considers that a more accurate comparison might, therefore, compare average customer revenues more generally or the prices of flagship products. For example, the majority of fibre customers in Bahrain are on the 20Mbps product (while 60% of customers remain on 10Mbps and 14Mbps services), for which the price in the business case model is approximately BD 10. This price is broadly in line with the benchmarks shown by Viva. Indeed, further benchmarks identified by the Authority of other island nations show prices at similar levels for 20Mbps products, such as BD 7 and BD 8 in Guernsey and Cyprus respectively.

The Authority also has concerns around the benchmarking provided by Viva for the connectivity products in the draft RO. In particular, the Authority notes that Viva has provided only a very small sample of benchmarks, with these also showing a significant variation in price terms, meaning it is difficult to draw conclusions from these benchmarks on the appropriate price terms for these services in the SE RO.

However, notwithstanding the above and for the reasons set out in its consultation on the Draft RO Order, the Authority does believe that the price levels for all services included in the Draft Amended RO should be reduced to more appropriate levels. The Draft RO Order therefore contains reduced prices, compared to those set out in the draft RO.

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<th>Zain</th>
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<tr>
<td>Zain has not had an opportunity to review the details of the cost element assumptions or a copy of the full or abridged version of the SE Business Plan. As Zain’s comments are noted.</td>
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such, Zain is unable to comment, with a level of assurance, on the suitability of the price terms set out in the RO. To align with NTP-4 and NERF objectives, Zain suggests:

- The wholesale products such as MBS and ICCS which are considered an input element to run the operation, and therefore a utility, should be priced at cost recovery level. This is mainly because backhaul product is a base product which the mobile operators have yet to build on by investing heavily in other network elements, systems and customer experience in order to be competitive in the market. Increasing the cost of such utility service will, therefore, have a direct impact on the mobile service price level. Consumer affordability is one of the main objectives of the NTP-4 policy so it would be a self-defeating effort to price the utility products at unfeasible price levels to achieve the SE business plan.

- The wholesale products that are resale products, such as WBS and WDC, should be offered with a return margin. As the Licensed Operators add no further efforts or margins on top of this product before selling it to an end user, Licensed Operators can undercut each other’s prices as much as possible. Changes to cost structure alone can shift the location of a wholesale product along the value chain to be close to a downstream product (i.e. downstream pricing products as low as 5% mark-up of the wholesale cost). Accordingly, the competition constraint will form the safeguard for consumer affordability.

- Furthermore, for such resale products, value-based price differentiation of residential versus business market segments is a mechanism by which it allows the SE to earn a fair return on investment without defeating NTP-4 goal.

As set out in the Consultation Document, the Authority has applied four principles to its review of the draft RO price terms. These principles are that the RO should:

- Support the delivery of the NBN;
- Promote efficiency in the supply of telecommunications products and services in the telecommunications market in Bahrain;
- Promote service-based competition in the telecommunications market that is fair, effective and sustainable; and
- Promote efficient investment and hence support the development of a sustainable, future-proof network.

In practice, the Authority considers that with regard to the RO price terms, these principles mean that the SE must be able, when operating reasonably efficiently, to earn a reasonable return, taking into account its cost of capital. At the same time, the SE’s prices must support effective downstream competition, meaning that the SE’s prices must enable downstream operators other than the BRE, to match and profitably compete against, prevailing retail prices today, thus, in turn, stimulating demand for the SE’s services. This is akin to the second objective set out by Zain. However, the Authority does not believe it would be appropriate to move at this stage to setting RO price terms equal to cost. This is because currently, the Authority recognises there are some uncertainties in the business case which it does not believe are adequately reflected in the cost of capital on which that business case has been derived. For example, these relate to both the long term demand for the SE’s services (which will be driven by consumer demand for fibre services and the rollout of 5G) and the costs the SE will incur to complete the “operational” aspects of separation and ensure all services are provided on an EOI basis.

Therefore, the Authority considers it is appropriate to allow the SE the possibility to earn a return above cost of capital in the short term. That is, it does not propose to set any of the RO prices at cost oriented levels.

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1 The business case assumes a cost of capital of 9.5%, in line with that set previously by the Authority.
<table>
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<tr>
<th><strong>Etisalcom</strong></th>
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<tr>
<td>Price terms are currently set from SE perspective only and do not take into account the prices of these services globally. The prices should be in line with the international market to ensure that services offered to clients/Companies are not more expensive than what they are offered internationally.</td>
</tr>
<tr>
<td>Etisalcom’s comments are noted. As set out above in relation to Viva’s comments on this question, the Authority considers that benchmarks should not, where possible, be used as a primary source of information for determining appropriate price terms, while any actual benchmarks should be reviewed with care. As Etisalcom has not provided any actual benchmark figures, however, it is not possible for the Authority to comment on the generality of the point it makes.</td>
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<tr>
<th><strong>Infonas</strong></th>
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<tr>
<td>Infonas believes that current prices are similar to Batelco’s existing RO, which contradicts the main goal of NBN of delivering high bandwidth services. Infonas is of the opinion that current prices do not attract the market to move to higher bandwidth services, considering other countries are providing much cheaper prices/capacity. Bahrain falls in the 89th place in the global index of average Internet bandwidth (Source: SpeedTest).</td>
</tr>
<tr>
<td>The Authority notes however, that it has proposed a number of price reductions. Infonas is correct to observe that the draft RO did not include reductions from the existing price levels for RO services. The Authority also believes it is important that the SE offers its services on terms and conditions which...</td>
</tr>
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make those services attractive to OLOs, while not detracting from the financial sustainability of the SE.

To this end, and as set out elsewhere, the Authority notes that it has proposed a number of price reductions for those services that were included in the draft RO. Together with other aspects of the Draft RO Order, the Authority believes that this should further incentivise the take up of higher bandwidth services in the Kingdom, to the benefit of all parties.

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<th>NBN (Batelco)</th>
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<tr>
<td>The principles set out in paragraph 6.1 of the consultation document reflect the principles set out in NTP4 and the NERF. These include:</td>
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<tr>
<td>• To support the delivery of the NBN;</td>
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<tr>
<td>• To promote efficiency in the supply of telecommunications products and services in the telecommunications market of Bahrain;</td>
</tr>
<tr>
<td>• To promote service based competition in the telecommunications market that is fair, effective and sustainable; and</td>
</tr>
<tr>
<td>• To promote efficient investment and hence support the development of a sustainable future proof network.</td>
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</table>

The present RO is entirely transitional and the pricing reflects numbers and data that are not based on a final business case nor on guaranteed customer forecasts. There are also substantial wider uncertainties underpinning the present numbers. NBN is working to move this forward transparently with the TRA but there is still work to be done. As the multiple uncertainties are removed and the business case is substantially more developed and there are definitive customer forecast projections available, NBN will have a better view on pricing.

NBN (Batelco)'s comments are noted.

Since the deadline for submission of responses to the Consultation Document, the Authority has worked closely with the SE to understand the nature of the uncertainties referred to by the SE in its consultation response. As a result of this, the Authority is satisfied that it would be appropriate, and in line with the principles set out in the consultation, to include in the Draft RO Order, price terms for the RO service set which are below the levels initially proposed by the SE. This is because the Authority is satisfied that such price reductions do not materially distract from the SE's business case model. However, prior to moving to the longer term pricing framework set out in the NERF, and as part of its next RO review, the Authority will further review the development of the SE business and financial position, to determine whether those prices remain appropriate.
<p>| BRE (Batelco) | BRE partially agrees; provided that the necessary consultations with the relevant stakeholders are taken into account. There are a number of price control methods, which, depending on the results of the consultations, may prove to be more effective. BRE (Batelco)’s comments are noted. The Authority will consult with industry, as appropriate. |
| Viva | Viva note that any alternative pricing framework must still comply with Article 57(b) of the Law and the Access Regulation of 2005. Viva’s comments are noted. As regards Viva’s reference to Article 57(b) of the Law and the Access Regulation, the Authority refers Viva to the Authority’s comments on this point under Question 9 and Question 14 above. |</p>
<table>
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<tr>
<th>Company</th>
<th>Comments</th>
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<tr>
<td>Zain</td>
<td>Yes.</td>
</tr>
<tr>
<td>Etisalcom</td>
<td>Prices should be reviewed on an annual basis taking into account the technology innovations and market competition in the region and globally. Etisalcom's comments are noted. The Authority proposes to review the initial RO within eighteen (18) months from its publication. This review will include a review of both price and non-price terms. Going forward the Authority notes that section 4.9 of the draft Amended SE License envisages that the RO will be reviewed every two (2) years or before that, at the request of the Authority. The Authority does not consider however, that it is necessary or appropriate at this stage to commit formally to a review every twelve (12) months. However, the Authority will continue to keep this under consideration.</td>
</tr>
<tr>
<td>Infonas</td>
<td>No comments.</td>
</tr>
<tr>
<td>NBN (Batelco)</td>
<td></td>
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</table>
• NBN is concerned that the TRA seems to have focused solely on multi-year price control models rather than the building block model ("BBM") set out in the NERF (see para 355), which establishes a framework for setting a revenue envelope for NBN over a period of years.
• NBN accepts that there may be a case (where economically justified) for certain products to have an additional regulatory constraint of a multi-year price control, within the revenue envelope. NBN would expect the TRA to develop this framework over the course of the next 18 months to align with the proposed review of the transitional ROI.
• NBN has been working closely with the Authority to develop price models and structures for RO prices for the transition period and to work with it on the interim business plan. NBN agrees that it is currently too early to move towards the BBM framework and any potential elements involving multiyear price controls within that framework.
• Economic and financial analysis/discussion and industry consultation is required to determine the appropriate practical long-term regulatory revenue and pricing framework for NBN.

The Authority notes the SE’s comments on the move to the future framework. However, it does not believe that these accurately reflect the Authority’s position.

The Authority believes that its references in the Consultation Document to a multi-year price control are entirely consistent with the principles set out in the NERF. This is because any such price control would be determined through an analysis of the (updated) SE business case model and the application of a building block model of regulation. Furthermore, such references should not be construed to mean that the Authority has decided on the form of price control that could be applied on any individual products within the overall framework of price control.

Finally, the Authority is committed to consulting further with stakeholders on the introduction of the long term pricing model.

Question 16: Do you agree with the criteria identified by the Authority for determining when OLOs other than Batelco Retail could be required to relinquish control of their existing fibre assets, as set out at paragraph 6.23 and paragraph 6.24 of the Consultation document? If not, please provide alternative criteria which you consider will better meet the objectives of sector policy?

BRE (Batelco)

• BRE does not agree with the criteria identified by the Authority for determining when OLOs could be required to relinquish control of their existing fibre assets.

BRE (Batelco)’s comments are noted.
• BRE believes that the examples provided by the Authority as pre-conditions for the transfer of such assets are of a subjective nature, and that the Authority’s approach in this regard should not be conditional upon achieving EOI, whether subjective or objective.

• BRE finds it imperative that the Authority fulfils NTP4’s main purpose to establish a separated entity operating a standalone infrastructure. It is unreasonable for BRE to relinquish its fibre assets years ahead of OLOs without any undertakings or fixed commitments from OLOs, mandated by the Authority, to transfer their assets.

The Authority does not consider it necessary at this stage to require OLOs to relinquish control of their fibre assets to the SE. BRE’s position – as a vertically integrated entity within the Batelco group – is different from that of OLOs, and must be considered in the context of the legal separation of Batelco.

The Authority considers that the SE’s product set must be fit for purpose before OLOs might be required to relinquish their fibre assets.

<table>
<thead>
<tr>
<th>Viva</th>
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<tbody>
<tr>
<td>Yes, in general terms. Viva believe that SE must provide passive and active access on Eol terms before any relinquishment can take place.</td>
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<tr>
<td>Viva’s comments are noted. The Authority does not propose any amendments to the draft RO in this respect.</td>
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<tr>
<th>Zain</th>
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<tbody>
<tr>
<td>Zain strongly disagrees on relinquishing control of its existing fibre assets. The fibre assets represent private property protected by legal ownership rights in the Kingdom of Bahrain.</td>
</tr>
<tr>
<td>More importantly, these are integrated network elements of Zain’s network and are crucial for its operations. The intrinsic value the fibre assets have and continue to provide to Zain in running its operation far exceeds the calculated monetary compensation evaluation method suggested in Article 6.24.</td>
</tr>
<tr>
<td>Zain’s comments are noted. The Authority continues to believe that the migration and/or decommissioning of OLOs’ fibre assets is, ultimately, part of the intended objectives of NTP4 to create the NBN / SE. The Authority therefore does not propose any amendments to the draft RO in this respect.</td>
</tr>
<tr>
<td>In terms of timeline and process, the Authority refers to the Consultation Document on the draft RO, and the Authority’s consultation on the Authority’s proposed amendments to Telecommunications Licenses held</td>
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</table>
Zain calls upon the Authority to take cognisance of the significance of this asset in Zain's commercial and technical operation sustainability. Zain's network is designed around the existing fibre assets; therefore, the relinquishing of this invaluable asset requires an expensive restructuring of the entire network design.

Major changes will need to be made such as altering hub sites topology and distribution, sites aggregation rerouting, modifying the logical and geo-redundancy setups, reaching international capacities, systems and contents dispersal. This will entail high costs and time, operational and technical burdens that Zain will not be able to undertake.

The extent of the fibre assets which Zain owns and controls today is small in comparison with the volume of fibre assets Batelco controls and therefore Zain does not foresee how it is relevant to discuss relinquishing the control of Zain's existing fibre assets at this phase where the important milestone is to achieve the separation.

by the Licensed Operators other than the Bahrain Telecommunications Company BSC (Batelco) (the "OLOs") in light of the legal separation of Batelco (the "Amended Licenses") (LAD/0219/056). The envisaged process for setting a timeline and roadmap regarding any proposed migration and/or decommissioning of OLOs' fibre assets to the SE is further explained in those documents.

In addition, the Authority notes that section 3.4 and section 3.6 of the draft Amended NFL License for OLOs (provided at Annex 1 to the Consultation on the Amended Licenses) proposes, among other matters, that the Authority would consult with OLOs at the relevant point in time. In the meantime, OLOs should be allowed to maintain their own fibre assets / networks until such time as they are required to migrate and/or decommission their fibre assets under section 3.4 of the Amended NFL.

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**Etisalcom**

As the SE objective is to establish and control the National Broadband Network, Etisalcom believe all infrastructure that is currently owned and managed by other OLOs or any other entity should be available through SE to other OLOs at the same pricing as defined SE RO (e.g. areas such as Durrat Bahrain, Diyar Muharraq, Dilmunia, Amwaj, Reef, Riffa Views, etc. should also have prices in line with the SE RO and be available to all OLOs).

Etisalcom's comments are noted. Etisalcom is requested to note that currently OLOs will retain their existing fibre assets – including those in private developments – until such time as OLOs may be required to migrate and/or decommission those assets (as provided for in section 3.4 and section 3.6 of the draft Amended NFL License for OLOs).

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**Infonas**

No:
- Infonas requires more criteria to be included, such as but not limited to:
  a. Supporting 100Gbps capacity and above.
  b. Supporting L1 services including SDH, OTN and Clear wavelength services... etc. (see response to question 5)
  c. Availability of Passive Dark fiber/Duct rental access services.
  d. SE being able to provide compliant services to the US navy base (see responses above).
- Relinquishment of fibre has not been sufficiently addressed throughout the Consultation Document or RO draft – leading to uncertainty about the future of Infonas infrastructure; Infonas requires clarification in this regard given the two year EoI timeline.
- Acquisitions of OLO fibre assets/ networks should be carried out on a commercial basis, allowing OLOs to go through a professional valuation exercise.

Infonas' comments are noted. The Authority does not consider it necessary or appropriate at this time to make specific reference to items (a) to (d) opposite as a precondition to migration and/or decommissioning of OLO fibre assets. The Authority will, however, look more broadly at the fitness for purpose of the SE’s active product set, which might include factors wider than those listed in (a) to (d).

Separately the Authority notes that the Authority’s proposed revisions to the SE’s product set under the Draft Amended RO should address Etisalcom’s points in (a) to (d).

In terms of Infonas’ comments on the timing of the process for migration and/or decommissioning and compensation, the Authority considers that it is too early to provide a definitive timeline, much less definitive view on whether (and if so) the extent of any compensation that might be available. However, the Authority will consult with industry on all of these parameters at the relevant point in time.

### NBN (Batelco)

<table>
<thead>
<tr>
<th>NBN accepts that, for economic efficiency, it is reasonable for the transfer of existing fibre assets of OLOs to NBN to be effected once NBN is able to provide fit-for-purpose active services (to replace those that the OLOs currently provide for themselves using those fibre assets).</th>
<th>NBN (Batelco)’s comments are noted.</th>
</tr>
</thead>
<tbody>
<tr>
<td>NBN expects the TRA to pay utmost regard to the cyber-security needs of the Kingdom in setting out its criteria for the transfer of fibre assets (see part IV of the NTP4).</td>
<td>As indicated above, the Authority will consult with industry at the relevant point in time concerning the overall process and timeline for any proposed migration and/or decommissioning as well as on potential compensation mechanisms that might be required. The SE will be able to provide its</td>
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<td>The timing of arrangements for the transfer of assets will have a significant impact on NBN’s business case and financial viability by impacting levels and timing of demand for active assets and the overall</td>
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cost base of NBN. Therefore the handling of the transfer of OLO assets will have a fundamental impact on NBN’s business case as that case has been constructed on the basis of NBN not being liable for compensation to OLOs for any asset transfers.

- Any change to the assumptions underpinning that business case would in turn impact on the scale of the price reductions achievable for the provision of products. Therefore, in considering the criteria for the transfer of OLO assets, one key criteria is that NBN is financially viable and is able to earn a fair return on its investment (article 24 (e) of the NTP4).

views on potential impact on its business case and financial viability, at that time.

At this stage, however, NBN (Batelco)’s basis for reference to a ‘fundamental’ impact on SE’s business case is unclear. On the one hand, the Authority understands that duct rental revenues are included in the SE’s business case. On the other hand, in the event that the SE is no longer able to achieve duct rental revenues (following migration and/or decommissioning of OLOs’ fibre assets), the SE should be able to achieve revenue from increased take-up of its active product set.

Question 17: Do you agree with the areas of concern identified by the Authority in relation to the WBS service description, as set out in paragraph 7.7 of the Consultation document? Please order your responses in accordance with the illustrative list of concerns set out.

BRE (Batelco)

No comments.

---

Viva
Yes – largely agree (specific comments on WBS SD are in Annex 1 of the Viva Submissions at Appendix 1 of this Consultation Report).

Viva’s comments are noted.

**Service Terms**

- **Clause 3.1:** The Authority agrees with Viva’s comment that the WBS Service should be available also to non-residential (business) End-Users. The Authority has therefore proposed specific amendments to the Service Description to confirm that the WBS is available for both residential and non-residential End-Users.

- **Clause 3.2:** The Authority notes Viva’s comment that there should not be any specific limit on batches. The Authority has proposed an amendment to this particular point. The number of Service Requests per batch remains at ten (10) but the Authority proposes that up to ten (10) batches a day be allowed.

- **Clause 3.4:** The Authority has proposed removing any minimum service period from the WBS Service Description. As regards Viva’s request that wording be reinstated to confirm that the Access Seeker (Licensed Operator) is not liable to pay liquidated damages if the cancellation is directly caused by a breach by the SE, the Authority has proposed more limited circumstances in which the SE can cancel a service. The Authority trusts that this addresses Viva’s concern on this matter.

- **Clause(s) 3.4 and 3.5:** The Authority notes Viva’s comment that the SE should be required to provide at least twenty-four (24) months’ notice to Access Seekers prior to ceasing the WBS. The proposed Service Description in the Draft Amended RO does not provide for the SE to terminate the WBS service at will. The SE will only be entitled to terminate the service in the event of a material breach. The Authority has proposed the removal of the SE’s ability to terminate immediately, even in the event of material breach. Instead, the SE would be required to give at least twenty (20) Business Days’ written notice to the Access Seeker to
remedy the breach, failing which and only then could the SE terminate the service.

**End User Access**

- **Clause 4.1:** The Authority notes Viva's comments that there should not be any linkage to the end-user's standard telephone line / useable line. The Authority does not consider that there is a requirement for the End User to have an existing operational standard telephone line (“useable line”) to take the WBS Service. The Access Seeker should be able to request the WBS Service where the End User is not already an End User of another service provider.

- **Clause 4.3:** The Authority notes Viva's comments that the SE's ability to suspend or terminate the services should be dependent on fault on the part of the Access Seeker. The Authority has proposed this wording to be removed as the Authority considers that it could give too much power to the SE. be unfair to Licensed Operators.

- **Clause 4.6:** Viva's comments regarding availability of maps are noted. The Authority has included within the WBS Service Description in the Draft Amended RO that the SE shall provide access to an online tool that identifies up-to-date digital coverage maps for the areas in Bahrain covered by the WBS Service. This tool shall also identify the maximum speed supported for each address (i.e., block or building) and the connection type (i.e., copper or fibre) to ensure that the right service is offered by the Access Seeker to the End-User. The Authority has also proposed that this online tool should be updated at least on a monthly basis.

**Maintenance**

- **Clause 5.1:** The Authority has clarified in the WBS Service Description that the SE shall provide network maintenance and support services to ensure that all of the network elements used to provide the WBS Service are provided to the Access Seeker at the same level of quality of service and availability as provided for the equivalent WBS service elements supplied to all Access
Seekers (emphasis added). The reference to ‘all’ Access Seekers is intended to clarify that the SE must not prefer BRE over OLOs.

Equipment
- Clause 6.2: The Authority has included specific reference to Article 38 of the Telecommunications Law i.e., recognising that the reference to ‘approval’ of the equipment relates to an approval under that article of the Law.

Connection
- Clause 7.2: The Authority notes Viva’s comments regarding the indemnity for IP addresses. As this was not contained in the original wording of the draft WBS Service Description, and is also not included in the relevant WBS Service Description in the Draft Amended RO, the Authority does not consider any changes are required on this point.

Zain

Bitstream, Bitstream Plus and WBS are almost substitute products serving the same purpose for different speeds. Therefore, Zain is recommending consolidating the three documents into one Service Description, named WBS. Zain has marked its concerns and comments to the WBS service description in its mark-up of the RO (also discussed at the recent TRA-Zain Workshop). See also the extracts from Zain’s Submissions at Appendix 2 of this Consultation Report.

The revised Draft Amended RO has merged the three bitstream services into one Service Description.

As explained above, WBS, Bitstream and Bitstream Plus have been merged into a single WBS Service. The single WBS Service has been drafted to be technology agnostic, i.e. the WBS Service can be provided over both copper and fibre as well as to both residential and non-residential End Users. The WBS Service Description has an increased
range of speeds available to meet the requirements of the technology and the End-User.

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<th>Infonas</th>
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<td>Yes.</td>
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<tr>
<th>NBN (Batelco)</th>
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<tr>
<td>Some of the concerns identified at a high level in the consultation document are the subject of ongoing dialogue between NBN and the TRA. NBN will be addressing those comments and any more detailed feedback from the OLOs as part of that dialogue.</td>
<td>NBN (Batelco)'s comments are noted. The Authority requires NBN (Batelco) to submit its comments as part of the formal consultation process, in order for such comments to be taken into account under the consultation process.</td>
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Question 18: Do you agree with the areas of concern identified by the Authority in relation to the DS service description, as set out in paragraph 7.8 of the Consultation document? Please order your responses in accordance with the illustrative list of concerns set out.

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<th>BRE (Batelco)</th>
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BRE has no specific comments on the 3 specific points raised in relation to the draft DS service description, but observes it is legitimate for the SE to offer different types of wholesale product for different types of licensed operator or for different purposes.

BRE (Batelco)'s comments are noted.

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<th>Viva</th>
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<tr>
<td>Yes – largely agree (specific comments on DS SD are in <strong>Annex 1 of the Viva Submissions at Appendix 1 of this Consultation Report</strong>).</td>
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</table>

Viva's comments are noted.

**Adequacy of the Service Level Regime**
- The Service Levels and Penalties in the Draft Amended RO have been amended to include increased penalties. The increased penalties and the introduction of KPIs is intended to incentivise the SE to deliver the relevant Services in a timely and efficient manner. These will be monitored by the Authority and will be revised, if required.
- In the UK regulator's (Ofcom's) Business Connectivity Market Review (BCMR) Consultation Document, Ofcom was consulting on changes which included BT no longer being required to (a) obtain consent from the telecoms provider to set a Customer Delivery Date (“CDD”) of greater than fifty-seven (57) days; (b) pay compensation at one hundred per cent (100%) of one (1) month’s line rental per day up to sixty (60) days per orders not delivered by the CDD or the Customer Requirements Date (whichever is later); and (c) pay compensation at fifteen per cent (15%) of one (1) month’s line rental per hour up to two hundred (200) hours for faults not repaired within five (5) hours.
• The Authority considers that the setting of Service Level Penalties should be an incentive, and not punitive. Until there is a baseline of performance set against which performance targets and Penalties can be adjusted then it would not be appropriate to set Service Levels at a level not achievable by the SE. The UK market structure had been in place for a period of time before this situation was being consulted upon.

• With regards to the SE seeking consent to extend a provisioning period. This is appropriate to be considered as part of the Joint Working Manual. At that point in time consideration could be given to it being included in a revised Reference Offer or Service Level. The key purpose of the delivery times within the Draft Amended RO is to set targets that are achievable which would result in a limited recourse to the Service Levels and associated Penalties.

Direct and indirect losses from poor quality of service

• The Authority is first seeking to ensure that there is a monitoring solution in place for all RO Services, from which Quality of Service (QoS) performance targets and associated Penalties can be set.

• Specific factors like persistent and recurring faults are being addressed by the KPI process proposed.

Exposure to “gaming” by SE and Batelco

• The Authority is seeking to ensure that a Service Level, Penalty and KPI framework is developed that is fit for purpose and will not incentivise “gaming” by the SE and Batelco.

Ability to claim for damages

• The Authority is not proposing any changes at this time. However, the Authority will consider further submissions on the general
position regarding the SE’s purported limitation of liability toward Access Seekers (i.e., Licensed Operators). This includes also the purported limitations on the SE’s liability and restrictions on Access Seekers’ rights of recourse to the SE under the Supply Terms. The Authority notes that the provisions on such matters must be consistent with general principle of Bahraini Law.

**Planned outages**
- Planned outages have been replaced by emergency maintenance as a reason to delay provision. Planned outage is not excluded and therefore that delay would count towards the total deliver time.

**Demarcation**
- The Authority has not proposed any amendments to this particular aspect because the Authority is aware of different OLOs considering different strategies regarding the provision of CPE for WBS. The Authority considers this should be addressed as part of the Joint Working Manual. Further, the Authority considers this could (if necessary) be addressed in a later version of the Reference Offer e.g., following the review of the Reference Offer.

**Zain**

DS and MBS are duplicate products serving the same purpose. Therefore, Zain recommends that these products and their associated service descriptions should be consolidated into one Service Description which is to be referred to as MBS. Zain’s comments are noted. The Authority considers however that DS and MBS Services have different Quality of Services parameters. For this initial RO, the Authority therefore proposes that these two services remain
Zain has provided appropriate text setting out the recommended MBS service description in its mark-up of the RO (also discussed at the recent TRA-Zain Workshop). separate. However, in following reviews these two services could be reconsidered such that there is one rather than two services (possibly with a choice of different QoS variants and different pricing for each of the variants) if agreed by all parties.

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<th>Etisalcom</th>
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<td>Infonas</td>
<td>N/A</td>
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<tr>
<td>NBN (Batelco)</td>
<td>Same response to that in question 17. Please see the Authority's comments in response to Question 17 above.</td>
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Question 19: Do you agree with the areas of common areas concern identified by the Authority in relation to both service descriptions, as set out in paragraph 7.9 of the Consultation document? Please order your responses in accordance with the illustrative list of concerns set out.
There will have to be a fair delivery timetable for implementation in relation to the initial wave of orders for wholesale data connectivity products. It does not make sense to first set a greatly discounted price for the DS and then adjust delivery timescales to shorter periods, given there is a relationship between price and timescales for delivery.

BRE would support cost effective enhancements in provision of coverage information for all operators.

BRE notes the reference to “transparency of dealings” between the SE and BRE being important (para 7.9.4). BRE would agree with this and notes that the Authority is expecting wholesale supply terms to be entered into between the SE and BRE as soon as possible after issue of the RO order (and BRE assume issue of the SE license). This, together with maintenance of accurate records, will assist in documenting the evolving arm’s length relationship between SE and the BRE.

BRE (Batelco)’s comments are noted. It is noteworthy that the SE has not specifically addressed pricing issues in its responses to this Question.

Taking into account the evidence and submissions made by all parties, including the NBN (Batelco) (i.e., the SE), BRE and other operators, and in particular having considered the financial viability of the SE, the Authority has proposed, in the Draft RO Order, that the SE should be required to reduce the prices of the RO product set.

In proposing these reductions, the Authority has had regard to the SE’s proposed business case model and the potential uncertainties in that business case model as highlighted by the SE. The Authority does not consider that the proposed reductions – effective for 2019 and until the next RO review is completed – would undermine the SE’s business case model and/or the SE’s financial viability and therefore it would not expect, even given the acknowledged uncertainties in the business case, there to be a need to subsequently reverse those reductions in future ROs.

The Authority will continue to review the price and non-price terms of the RO as part of the Authority’s proposed first review of the RO, within eighteen (18) months from its publication. Depending on the outcome of that review, the Authority may require further price reductions.

In terms of BRE (Batelco)’s reference to the wholesale supply terms between the SE and BRE, the Authority has asked for the submission of copies of these before approval of the RO and/or issue of the Reference Offer Order and RO, and before award of the SE License.
Yes – largely agree (but Viva has specific comments on the key non-price terms, including the service level regime, in section 6 and Annex 1 of the Viva Submissions at Appendix 1 of this Consultation Report).

Viva’s comments are noted.

Adequacy of the Service Level Regime

- The Service Levels and Penalties in the Draft Amended RO have been amended to include increased penalties. The increased penalties and the introduction of KPIs is intended to incentivise the SE to deliver the relevant Services in a timely and efficient manner. These will be monitored by the Authority and will be revised, if required.

- In the UK regulator’s (Ofcom’s) Business Connectivity Market Review (BCMRR) Consultation Document, Ofcom was consulting on changes which included BT no longer being required to (a) obtain consent from the telecoms provider to set a Contractual Delivery Date (CDD) of greater than fifty-seven (57) days; (b) pay compensation at one hundred per cent (100%) of one (1) month’s line rental per day up to sixty (60) days per orders not delivered by the CDD or the Customer Requirements Date (whichever is later); and (c) pay compensation at fifteen per cent (15%) of one (1) month’s line rental per hour up to two hundred (200) hours for faults not repaired within five (5) hours.

- The Authority considers that the setting of Service Level Penalties should be an incentive, and not punitive. Until there is a baseline of performance set against which performance targets and Penalties can be adjusted then it would not be appropriate to set Service Levels at a level not achievable by the SE. The UK market structure had been in place for a period of time before this situation was being consulted upon.

- With regards to the SE seeking consent to extend a provisioning period. This is appropriate to be considered as part of the Joint Working Manual. At that point in time consideration could be
given to it being included in a revised Reference Offer or Service Level. The key purpose of the delivery times within the Draft Amended RO is to set targets that are achievable which would result in a limited recourse to the Service Levels and associated Penalties.

Direct and indirect losses from poor quality of service

- The Authority is first seeking to ensure that there is a monitoring solution in place for all RO Services, from which Quality of Service (QoS) performance targets and associated Penalties can be set.
- Specific factors like persistent and recurring faults are being addressed by the KPI process proposed.

Exposure to “gaming” by SE and Batelco

- The Authority is seeking to ensure that a Service Level, Penalty and KPI framework is developed that is fit for purpose and will not incentivise “gaming” by the SE and Batelco.

Ability to claim for damages

- The Authority is not proposing any changes at this time. However, the Authority will consider further submissions on the general position regarding the SE’s purported limitation of liability toward Access Seekers (i.e., Licensed Operators). This includes also the purported limitations on the SE’s liability and restrictions on Access Seekers’ rights of recourse to the SE under the Supply Terms. The Authority notes that the provisions on such matters must be consistent with general principle of Bahraini Law.

Planned outages

- Planned outages have been replaced by emergency maintenance as a reason to delay provision. Planned outage is
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Demarcation
- The Authority has not proposed any amendments to this particular aspect because the Authority is aware of different OLOs considering different strategies regarding the provision of CPE for WBS. The Authority considers this should be addressed as part of the Joint Working Manual. Further, the Authority considers this could (if necessary) be addressed in a later version of the Reference Offer e.g., following the review of the Reference Offer.

Processes to support forecasting, ordering, provisioning and fault handling

Forecasting
- The Authority has reviewed the forecasting requirements that were included in the draft Reference Offer submitted by the SE and to which the Consultation Document relates. The Authority is of the view that forecasting is a fundamental input to the SE to ensure that it is able to meet the requirements of Licensed Operators. The Authority is therefore proposing that forecasts should be provided such that Licensed Operators would be required to provide binding quarterly forecasts for OWS and FAS; and to provide non-binding forecasts for WDC, DS and MBS. The Authority does not consider that there should be a forecasting requirement for WBS Services which are mass market services.
- In the event that the number of actual Service Requests is greater in a quarter than the forecasted amount, the SE shall use all reasonable endeavours to provide the requested Connections,
but cannot guarantee that the Connections (i.e., Services) will be provided in the timescale set out in the Service Level Schedule.

- The Authority will seek stakeholder views regarding the applicability and parameters relating to the binding nature of forecasts (where required), including the appropriate remedy that should be made available in the event that Licensed Operators do not comply with their forecast(s).

**Ordering**

- The Authority agrees that the use of a portal is the appropriate way forward for dealing with Service Requests. This is reflected in relevant Service Descriptions.

**Provisioning**

- The Authority considers that the framework regarding VIP installations should form part of the Joint Working Manual.
- The Authority has proposed that the technician’s ability to go on site is subject to this being within working hours. As part of the introduction of working practices between the SE and Licensed Operators the Authority considers use of an appointment book for technicians / End User installation appointments should be a standard feature.
- The Authority has proposed that the ‘next available date’ should be no later than 2 working days.

**Fault management**

- The Authority is of the view that pro-active fault monitoring should be considered as part of the Joint Working Manual and if
appropriate, could be included in future reviews of the Reference Offer (which would include specific aspects of the relevant Service Descriptions).

- Likewise the Authority considers that a dispute resolution process should be considered as part of the Joint Working Manual and if appropriate, be included in future reviews of the Reference Offer (which would include specific aspects of the relevant Service Descriptions).

- The Authority has reviewed the list of exceptional circumstances provided in the Service Descriptions. The Authority notes Viva's concern regarding "events either caused by or which are under the reasonable control of the AS or its retail end-customer." The Authority considers that this should be sufficiently addressed by the reference to Force Majeure in the relevant clause. The Authority has limited the list of exceptional circumstances and removed certain items including the above linkage to events stated to be the responsibility of Access Seekers or End Users.

- The Authority further proposes that sufficient evidence is required before the SE can rely on the existence of exceptional circumstances so as to delay delivery date(s). The relevant provisions have been amended accordingly in the relevant Service Descriptions.

- The Authority considers that additional activities should be considered as part of the Joint Working Manual and if appropriate, could be included in future reviews of the Reference Offer (which would include specific aspects of the relevant Service Descriptions).

- The Authority has considered Viva's submissions regarding restoration out of hours in the Service Descriptions. This has been addressed with a different time to resolve a fault.
The Authority has considered Viva’s submissions that the SE should develop a gateway interface to provide a fault placement and tracking system to OLOs to report, follow-up and view the performance of the SE’s Service Levels. The Authority has proposed, as part of the introduction of EOI, that an interface for fault management would be scoped.

**Service Terms**

- **Clause 3.1:** The Authority agrees with Viva’s comment that the WBS Service should be available also to non-residential (business) End-Users. The Authority has therefore proposed specific amendments to the Service Description to confirm that the WBS is available for both residential and non-residential End-Users.

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**Equipment**
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**Connection**
- Clause 7.2: The Authority notes Viva’s comments regarding the indemnity for IP addresses. As this was not contained in the original wording of the draft WBS Service Description, and is also not included in the relevant WBS Service Description in the Draft Amended RO, the Authority does not consider any changes are required on this point.

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<tr>
<th>Zain</th>
<th>Refer to Zain’s responses to questions 17 and 18.</th>
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<td>Please see the Authority’s comments in relation to Questions 17 and 18 above.</td>
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### Infonas W.L.L

Infonas would like clarification from the Authority on the below:

- **a)** Paragraph 7.9.1: What defines reasonable industry standard?
- **b)** Paragraph 7.9.5: OLO’s should have the right to look into the justifications documentation and give their opinion on the same.

- **Paragraph 7.9.1:** The Authority considers that reasonable industry standards are dependent on the specific services in question and in light of market circumstances at the time.

- **Paragraph 7.9.5:** The Authority will review the SE’s prices, and if appropriate, may consult subject to removal of any commercial / business sensitive information.

### NBN (Batelco)

Same response to that in question 17 and 18.

- **Please see the Authority’s comments in relation to Questions 17 and 18 above.**

### Question 20: Do you have any other comments not considered specifically above that you wish to raise?

### BRE (Batelco)

In relation to Schedule 9 (Main Terms): in addition to BRE’s general comments about an overall revision being carried out in the next 18 months, there are certain clauses which would not be applicable to companies within the same group. In particular:

- BRE (Batelco)’s comments are noted.
  - The basic principle remains that BRE must be treated as a separate company from SE and must not be preferred when compared to OLOs. To the extent that certain provisions might not be relevant, the Authority
- the security arrangements (clause 20 – credit management and security) for payment between SE and BRE should not be applied, especially given the BRE is the larger entity with the greater financial resources. The insurance obligations (clause 17.18) would not be appropriate, depending on future arrangements (whether such items are permitted to be shared).
- Similarly, customer relationships and confidentiality (clause 21 and 22) may require revision to reflect the new compliance requirements in the undertakings, governance protocol and license to be issued to the SE.

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<th>Not at this stage.</th>
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<th>Zain</th>
<th>Yes – see Zain’s response to question 21.</th>
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<td>Please see the Authority’s comments in relation to Question 21.</td>
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<tr>
<th>Etisalcom</th>
<th>Yes – Etisalcom has package and provisioning issues (see response to Question 21 below).</th>
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<td>Please see the Authority’s comments in relation to Question 21.</td>
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<td>Entity</td>
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<tr>
<td>Infonas</td>
<td>Well defined KPIs must be imposed on all parties involved, such as Batelco Retail, SE, OLO, and the Authority during the transition period. The Authority has proposed KPIs in the revised draft RO.</td>
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<tr>
<td>NBN (Batelco)</td>
<td>Yes – see NBN (Batelco)'s response to question 21. Please see the Authority's comments in relation to Question 21.</td>
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<tr>
<td>BRE (Batelco)</td>
<td>No further comments.</td>
</tr>
<tr>
<td>Viva</td>
<td>No further comments.</td>
</tr>
<tr>
<td>Zain</td>
<td>Zain's comments are noted.</td>
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The draft RO service descriptions do not include a product for connecting to the international landing station. However, based on the clarification received during the TRA-Zain workshop, Zain recommends that:

- Batelco’s Landing Party Agreement should be assigned to the SE, whereas the Capacity Purchase Agreement should be assigned to BRE;
- The SE be granted an International Telecommunications Facilities Licence (IFL) to provide international cross-connect service to the Licensed Operators; and
- The SE should charge the Licensed Operators for connecting activated capacities over international links in accordance with ICCS service description, including the currently connected capacity of BRE.

The Authority has reviewed the comments provided by stakeholders concerning international connectivity and specifically which entity within the Batelco group should hold the relevant IFL. The Authority’s final position on an international cross-connect service is still being formulated. Indeed, the Authority will be conducting a market review of the entire supply chain for international connectivity later this year. The Authority considers it prudent not to take any action at this stage that might pre-judge the outcome of such review.

### Etisalcom

#### Package Issues:

- Based on a comparison between end user prices in other GCC countries and Batelco’s TBS prices (which are only the port charges), Etisalcom would recommend lowering the port charges (hence the end user prices) even further for more competitive end user prices in the region.
- Upload speeds in the whole region are much higher than what is offered in Batelco’s TBS prices packages which need to be improved. Etisalcom recommends that the upload speed should be at least half of the download speed for better end user customer satisfaction.
- For improved competitiveness, Bitstream prices need to be lower than the LTE data prices.

Zain’s comments are noted:

#### Package Issues:

- The Authority notes Etisalcom’s comments and the retail price benchmarks it has provided. However, it does not consider that Etisalcom’s reference to a comparison between End User prices in other GCC countries and Batelco’s TBS prices is determinative in the current context regarding setting of wholesale prices for the various bitstream products contemplated under the Draft Amended RO. While bitstream charges are an input into downstream retail prices, the Authority notes that the retail price
MNOs in Bahrain offer LTE data with much higher uploads than Bitstream offering which will make it increasingly difficult for OLOs to compete with MNOs.

Provisioning Issues:

- Current practice is that during the provisioning phase, Batelco is in constant contact with the end user even sends SMS with Batelco sender ID throughout the provisioning process even though the end user is an OLO customer. With the SE, Etisalcom hopes that end users will only be contacted by the relevant service provider as the relevant service provider is legally and financially responsible for Bitstream connections.
- Service request and delivery timeline need to be improved. Currently, Batelco does not honour its SLA commitments, Etisalcom hopes that SE will improve the service delivery timeline in line with the SLA.
- Currently, end customer needs to sign the service order form which is really not required as the customer is dealing with another service provider (OLO). This practice needs to be changed and end user should only deal and be contacted by the relevant service provider that they are dealing with.
- Currently, it can take up to 12 calendar days for the service to be activated which is way too long as the Fiber is already available and request been accepted – Etisalcom request a total of maximum 5 working days for service delivery completion.
- Etisalcom recently sent a request for installation for Residential TBS for Fiber delivery and this was rejected due to unavailability of Fiber in the addressed area, while Batelco proposed the customer directly and installed the service over fiber next day. With SE, Etisalcom hopes that such incidents will stop happening and that SE will treat all licensed operators fairly and equitably.

benchmarks provided by Etisalcom highlight some significant variation in prices across the region, with those price variations likely to reflect factors such as the state and structure of competition and the role of regulation in each country.

- In any event, the Authority notes that it has proposed price reductions in the Draft Amended RO.
- As regards upload speeds, the Authority has proposed a revised set of upload/download speeds in the Draft Amended RO which the Authority considers should address Licensed Operators’ needs.

Provisioning Issues:

- The Authority has proposed amendments to the Draft Amended RO to restrict the SE from contacting the End User. The processes and systems implemented within the SE should ensure that only the OLO contacts the End User, at all times.
- The Authority has proposed that the Service Levels and KPIs in the Draft Amended RO are revised. The Service Levels and KPIs have been reviewed and improved to take into account comments received.
- The Authority notes Etisalcom’s comment regarding signature of the service order form. The Draft Amended RO has removed this requirement.
- The delivery / provisioning times have been reviewed in the Draft Amended RO. The existing provisioning times are similar to other
- Some areas are still not covered for Fiber installation, and no Estimated time for delivery (e.g. block 111, HIDD). This should be clarified and a proper timeline should be given for service delivery. It is proposed that through process improvement work based on the proposed KPIs, this is reassessed over time. All OLOs should be treated equally for the provisioning of services and this will be monitored.

- The Authority notes Etisalcom’s comment regarding rejection of orders due to stated unavailability of fibre. The Authority anticipates that as EOI and common system interfaces are implemented it would be the intention that such issues are stopped.

- The Authority considers that visibility of the available of fibre should be improved and there should be an obligation on the SE to provide online digital coverage maps that are updated on a quarterly basis. The Authority has proposed amendments to the Draft Amended RO to address this. In addition the Authority has proposed in section 4.7 of the draft Amended SE License that the SE is under an obligation to provide quarterly digital coverage maps with sufficient granularity to enable OLOs to assess and understand the SE’s current and planned deployment of its fibre infrastructure network.

<table>
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<tr>
<th>Infonas</th>
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<tr>
<td>Infonas does not accept paragraph 6.24 as this limits Infonas’s ability to provide quality of service and stability to end users. Should Infonas’s core network face any technical issues causing network incapability to</td>
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Infonas’ comments are noted.

- As regards the process and timing for consultation of OLOs regarding migration and/or decommissioning of fibre assets,
maintain quality of services then Infonas should not be restricted from upgrading or replacing such equipment, due to the exclusion of any investments in network elements made after 31st December 2018. This also applies to Infonas’ inability to remain updated with the latest ICT during the transition period.

- Infonas is concerned with the vague terminology on the “treatment of existing OLO fibre assets” as paragraph 6.22 stipulates that “the implementation of a single network may in due time, require OLOs to relinquish control of those fibre assets they currently own and control”. This will impose constraints on OLOs to stay abreast with the state-of-the-art global ICT standards, hence resulting in a failure to achieve the goals set in Bahrain Vision 2030.

- Cable Landing Stations should be considered as part of the International network, therefore, should not be under the SE. Infonas believes that cross connect charges between the International network to the country should be regulated.

**Infonas also raises the following questions:**

- What happens if OLO’s have more aggressive SLA with their customers than offered by the product listed under the draft RO? Infonas believes that SLA should match the OLOs SLAs that have been agreed upon with their customers.

- Who will be controlling and managing the SE network, the engineers under SE or the engineers under Batelco Retail? Infonas has concerns about the confidentiality if engineers from a competitor are involved.

- Concerns where Infonas receives customer requests for a completely diverse route, avoiding certain telecoms, in order to achieve full service resiliency: Infonas understands that SE will be running a fully resilient network and requests the regulator to advise on a network differentiation mechanism, where OLOs are able to identify different routes (For Authority refers Infonas to the Authority’s comments and responses to Infonas, in relation to Question 16.

- The Authority has reviewed the comments provided by stakeholders concerning international connectivity and specifically which entity within the Batelco group should hold the relevant IFL. The Authority’s final position on an international cross-connect service is still being formulated. Indeed, the Authority will be conducting a market review of the entire supply chain for international connectivity later this year. The Authority considers it prudent not to take any action at this stage that might pre-judge the outcome of such review.

- In terms of Infonas’ query regarding OLOs ability to agree more aggressive SLAs with customers, the Authority considers this is a commercial matter. It does not require amendment to the draft RO. OLOs take the risk on what SLAs they negotiate with their customers. The basic principle should be that the SLAs provided by the SE should be sufficient to support SLAs offered by the OLO. However, if the OLO wishes to offer much better SLAs then, unless it can negotiate a better SLA with the SE, the OLO would be required to take the risk itself.

- Infonas’ query concerning the identity of the engineers that will manage the SE network is noted. The Authority considers that to the SE’s network should be managed by SE engineers only, and/or third party sub-contractors appointed by the SE. The
example, can the SE name each network in a way to get the OLO's to identify them (i.e. Network A and Network B) so OLOs can identify which circuit is taking which route?  

The Authority is not proposing any amendment to the draft RO in this respect. However, the Authority considers that the independence and governance criteria proposed in sections 3 and 4 of the Amended SE License should be sufficient in this respect i.e., no change to the RO is required.

- As regards Infonas' query on network information, the Authority considers that the EOI principles and the separation of systems (provided for in the draft RO and in section 4 of the draft Amended SE License) should sufficiently address Infonas' comments regarding network information. The Authority considers that the requirement for identification of networks should however be included in the revised technical and operational documents that support the RO, such as the Joint Working Manual. The Authority will require the SE to ensure that this Manual is established within [three (3)] months of the effective date of the final Reference Offer Order, and the Manual is updated as necessary.

### NBN (Batelco)

- Security concerns must remain to the fore at all times and all stakeholders must recognise this. It will be key to have these dynamics recognised in both the EOI and product process and in particular, NBN reserves its right to provide other types of products or services if requested by National Security Agencies or the army or in the case of emergency.
- NBN aims to deliver products and services that will drive fibre penetration and broadband growth and will position the Kingdom of

NBN (Batelco)'s comments are noted.

The Authority reminds NBN (Batelco) that NBN (Batelco) (i.e., the SE):

- is required to offer wholesale only products (see section 5.3 of the Amended SE License), and that any proposed changes to the products and services, and/or price and non-price terms of such
Bahrain at the forefront of the region, and internationally, in terms of the digital network economy. In order to do so, NBN may need to tailor bespoke products to the specific requirements of specific OLOs, including on SLAs or other commercial elements, in order to allow them to meet their own retail objectives. These would be subject to wider rules on non-discrimination but all such requests will be assessed on the merits by NBN.

- NBN reiterates that the draft RO is a transitional one and that it is committed to developing and enhancing the service offer to reflect reasonable market demands based on engaging constructively with OLOs. It will move as quickly as possible towards delivering the relevant EOI models and until then will work to deliver products on an EOO basis, where required.

products and services, requires the Authority's prior written approval;

- must meet the reasonable requirements of Licensed Operators concerning product and service set (see section 5.2 of the Amended SE License);

- is required (under the Draft RO Order and section 5.4 of the Amended SE License) to provide the products and services under the revised draft RO on an EOI basis within twenty-four (24) months, unless otherwise determined by the Authority. During the initial twenty-four (24) month period and absent providing certain services on an EOI basis, the SE is required in any event to provide the products and services on an EOO basis. The SE is further required to provide a single common interface to Licensed Operators to order and track the progress of orders for the Licenses Services from day one.
APPENDIX 1

Viva Submissions – Extracts

Section 3: Equivalence requirements

Viva have a number of points to make on the TRA’s position in the RO Consultation:

1. NTP4 requires that the Separated Entity be subject to Eol “as a condition of the rights accorded to the new entity in relation to NBN deployment and operation”
2. For a FTIN Licence to be issued under Article 40(bis)(a), the Separated Entity must supply products and services “on an equivalence of inputs basis”
3. A common set of fair and reasonable Access terms must be offered by SE to all Licensed Operators under Article 57(e). If SE proposes different terms for Batelco/Batelco Retail Entity (BRE) and for Other Licensed Operators (OLO)s, then it would not be complying with the Law.
4. Batelco has had over two and a half years (since publication of NTP4) to prepare for separation of SE/meeting Eol requirements (little/nothing appears to have been done). Batelco should not be given another extension.

3.1 NTP4

Viva’s points in respect of Paragraph 24(f) (re: adopting strengthened regulatory safeguards which must include, at a minimum, effective measures to ensure that the new entity delivers NBN-based wholesale products and services to the Incumbent Operator’s retail business unit(s) and its competitors on an Eol basis):

- The “strengthened regulatory safeguards” are a condition of the rights and responsibility accorded to the SE. There is, therefore, a fundamental relationship between the licensing of the SE to deploy the NBN and these strengthened safeguards.
- The strengthened safeguards “must be adopted” – this is a mandatory requirement.
- The strengthened safeguards include Eol “at a minimum” – EoO is of a lesser standard to Eol and Eol is the minimum.
- NTP4 is clear – there is no interim state between when SE is established and licensed and the requirement to comply with Eol. Accordingly, in adopting an EoO standard for at least a further two years, the TRA will not be acting “In a manner that is consistent with the objectives of the National Plan for Telecommunications” (required by Article 3(e) of the Law).

3.2 Article 40(bis)(a)

In reference to Article 40(bis)(a) (relating to the FTIN Licence) and the definition of a FTIN Licence in the Law (i.e. to be provided on a wholesale only and Eol basis), Viva say:

- An individual licence issued to the SE that provides for an EoO standard will not be a FTIN Licence under Article 40(bis)(a) – due to not meeting the Eol standard.
- Such a licence may be a “transitional measure” under Article 40(bis)(b), but it would still need to “safeguard equivalence between Licensed Operators”. Viva do not believe that an across-the-board EoO standard does “safeguard equivalence”. Comparability, a weak and loose term at the heart of Batelco’s definition of EoO, is not equivalence (it means similar).
- A transitional measure would safeguard equivalence if OLOs and Batelco were treated the same. If they are treated differently, but similar, that is not safeguarding equivalence. Batelco may be preferred, in myriad ways, to OLOs in an EoO environment.
- Conclusion: the TRA’s proposals in Paragraph 24(f) will not satisfy the requirements of a FTIN Licence (and likely not satisfy a transitional measure) under Article 40(bis)(a).
3.3 Same Access terms applying to BRE as to OLOs

Article 57(e) of the Law states:  
"A Public Telecommunications Operator in a Dominant Position shall offer upon request Access to its Telecommunications Network on fair and reasonable terms to any Licensed Operator."

Viva Comments:

- A common set of fair and reasonable terms must be offered to all Licensed Operators. This requires that SE, as a dominant operator, must offer Access to "any Licensed Operator" on the same fair and reasonable terms. Batelco/BRE is a Licensed Operator, so are the OLOs. Therefore, SE must offer the same terms to OLOs as it offers to Batelco/BRE.
- SE cannot offer different terms to different Licensed Operators. If SE proposes different terms for Batelco/BRE and for OLOs, then it would be in breach of Article 57(e) of the Law.

3.4 Preparations made by Batelco

The TRA states in the Consultation Paper that:

"As regards equivalence, the Authority is aware that it is likely to take the Separated Entity up to two (2) years to be able to provide all NBN wholesale services on a true equivalence of inputs ("EOI") basis"

See earlier comments re: Batelco having since 2016 to prepare for Eol. Viva do not accept that there is any reason why Batelco should be given a further period to comply.

3.5 Other points

- Eol will ensure that SE’s RO is "non-discriminatory", as required by Article 57(b) of the Law.
- If, contrary to NTP4 and the requirements of the Law, the TRA does not insist on Eol, and instead permits across-the-board EoO, then there are no protections in favour of OLOs in the RO to ensure that the RO is "non-discriminatory".
- EoO, implicitly, permits discrimination in favour of Batelco/BRE. In Viva’s view, the reference offer would be invalid if Batelco/BRE was treated more favourably than OLOs because it would not achieve the legal requirement for non-discrimination. Viva don’t believe EoO can ensure non-discrimination.

Section 5: Scope of the SE product set – requirement to offer passive products

In reference to paragraphs 6.11 and 6.12 of the RO Consultation (that SE will not be required to offer passive access products as part of its RO): Viva believes that the TRA has failed to properly apply the Law and that the TRA cannot relieve SE of this obligation.

5.1 Requirement to provide Access under the Law

Re: Article 57(e) of the Law and the definition of "Access":

- Passive access involves "making available of telecommunications facilities" and "access to physical infrastructure". Therefore, passive access is a form of Access that Access Seekers (AS) may request under the Law.
- Article 57(e) requires that SE must provide Access to its Telecommunications Network (which includes passive access) "on fair and reasonable terms".5
- Duct access is to be dealt with differently to other forms of Access under the Law. SE will only be required to offer duct access "if the Authority considers that there is an essential
need for such Access*. SE may not pick and choose which forms of Access that it will provide. Neither can the TRA -- except in the case of duct access, where a different standard applies.

Article 57(b), which also applies to Access, provides that “terms and conditions and tariffs [for a reference offer] shall be fair, reasonable and non-discriminatory”. Article 57(b) does not allow the TRA to decide a particular form of Access isn’t required. Rather, it relates to the terms on which that Access is provided under a reference offer.

5.2 The TRA’s decision
Re: paragraph 6.11 of the RO Consultation: the TRA has misdirected itself and it is not entitled to override Article 57(e).

5.3 Dark fibre access
Dark fibre access (“access to physical infrastructure including … cables”) must be provided by SE on fair and reasonable terms. The Law is clear -- it is a form of Access. The TRA cannot accept a RO from SE that does not have a dark fibre access product.

5.3.1 Fair and reasonable terms

This should provide terminating segments of disaggregated access and backhaul and transmission segments (If required by the downstream operator, SE should also provide dark fibre for end-to-end segments).

- Where dark fibre is used in the access network or to connect to cell sites (or other non-customer premises), the whole fibre circuit should be available.
- In the backhaul or transmission networks between aggregation points, the TRA may consider WDM wavelength circuits (sometimes known as “grey fibre”), which may then be provisioned by the service provider. However, WDM is not likely to be a substitute for dark fibre for shorter distances for a number of years. Please see section 5.4 for further discussion.

Dark fibre is always the most flexible and least constrained media for use in the access network. In this regard, SE should provide one and two fibre circuits in the access network for use in point to point applications and, in particular, to connect to cell sites (as leased lines, depending on the configuration, may require one or two circuits).

Any dark fibre circuit will typically follow a route from a fibre aggregation point (usually located at a local telephone exchange) and terminate on some form of customer premise (whether this be a building or some other form of structure, such as a cellular tower). If a dark fibre circuit is required between two customer premise locations, it would be normal to route the fibre via at least one fibre aggregation point, which would then involve at least two dark fibre circuits.

There should be new build requirements on SE to provide network extensions to specific customer access points where dark fibre is not installed. Any new build should be implemented in the most economically efficient manner. Where SE is not willing or able to deliver dark fibre in a realistic timeframe or at a realistic price, then there will be a need for duct access as discussed below.

The technical, operational (provisioning and repair) and commercial aspects of SE’s wholesale dark fibre may be substantially the same as would apply to SE’s wholesale Ethernet services, although provisioning and repair times may be shorter (because SE would not be responsible for the electronics). The interconnection and accommodation services that apply to active wholesale
products should also apply to dark fibre. For clarity, there should be no restrictions on use of dark fibre or the capacity that it carries, other than that caused by the physical media itself.

Viva submit that a RO from SE must include a wholesale dark fibre product on these fair and reasonable terms. Viva suggests in Annex 4 terms and conditions for dark fibre product.

5.4 Suitability of WDM

- The cost to deploy DWDM is substantially higher than for CWDM.

- \textit{WDM-based PON technologies are not a short/medium term solution for shorter distances}\n  
The emergence of WDM based Passive Optical Network technologies over the next decade may make WDM options across shorter distances more attractive. However, this technology is not expected to be deployed in any scale over the next 5 years, so only offers a promise in the longer term.

- Further, it is highly likely that some applications will continue to require dark fibre in order to achieve the required service performance well into the future. Examples of such applications will be RF over fibre and 5G front-haul applications where the performance constraints will remain challenging for many years to come, forcing the need for dark fibre over any form of active media.

Therefore, Viva do not believe that WDM should be considered by the TRA as an alternative for dark fibre access, except for long-distance transmission, for a number of years.

5.5 Duct access

In relation to duct access discussions in the RO Consultation, the TRA has not addressed the issue required under Article 57(e), which is whether there is an essential need for duct access. It is not an acceptable reason under Article 57(e) for the TRA to say that duct access "may compromise the transition to the new industry structure". This has nothing to do with the essentiality of the service. If in fact duct access is essential, then SE must provide it on fair and reasonable terms.

Viva submit that duct access is an essential need, for the following reasons:

- Duct access provides protection for OLOs against failure by SE to deliver other forms of service in a timely or cost-effective manner. An OLO may require duct access from SE and then install its own fibre, where SE has failed to do so. OLOs cannot be hostages to SE's non-performance.

- Even if SE deploys the other forms of service, duct access provides protection for OLOs from poor service levels from SE, by allowing OLOs to have full control over the customer experience from sale to activation and throughout the customer lifetime. This is particularly important given the weak service level regime that is being proposed in the RO.

- OLOs that are mobile operators require access to infrastructure for fixed line links to cell sites or nests of cell sites. SE may have limited incentives to facilitate links to cell sites, as 5G and fixed wireless may potentially become substitutes for the services that SE provides. Mobile operators, therefore, need clear rights of duct access to ensure that they can establish links to cell sites.

- Duct access is also important in the critical routes connecting OLO's PoPs and Cable Landing Stations and OLO's PoPs and at SE's Optical Switching Nodes (OSN) (see further below)

\textit{Fair and reasonable terms}

A wholesale duct access product on fair and reasonable terms should include the following:
a) Upgrade of duct infrastructure
SE should be required to invest in upgrading its existing duct infrastructure to ensure that it is in an adequate condition to enable OLO access. The prices which SE could charge OLOs should be regulated by the TRA to reflect the forward-looking incremental costs of these additional investments.

b) Reservation of duct capacity
In respect of potential congestion issues, Viva note that reserving space in ducts and sub-ducts for other operators is key for reducing uncertainty in the time and cost associated with the physical rollout. In other countries, infrastructure owners have to reserve a portion of the duct for others and maintain it in a good working order (for example, Spain and Portugal[10]).

c) Duct repair
Viva acknowledge that there will be some cases in which it is not immediately possible for SE to provide space in ducts. In those cases, SE should repair the duct, clear its dead cables, provide an alternate route or provide dark fibre to the OLO. The end purpose is the same: to guarantee space for OLOs to deploy their network.

5.6 Importance of wholesale dark fibre access for 5G
For mobile operators, a wholesale dark fibre product is necessary to ensure the future-proofing of their networks. Without dark fibre capability, the ability for mobile operators to deliver the full range of services offered by 5G will be highly constrained. 5G has been designed to deliver a range of application outcomes. In this regard, applications have been grouped into three primary categories:

- Enhanced mobile broadband.
- Massive machine-type communication.
- Ultra-reliable low latency communication.

Each of these categories of applications puts substantial new constraints on the performance of the 5G networks, with the third category putting very tight constraints on packet delay, delay variation, packet loss and synchronisation across cells. This third set of applications is often referred to as sitting under the “mission-critical” banner (where high degrees of reliability are essential), and will put very tight constraints on the performance of the front-haul and back-haul of the 5G “New Radio” cellular systems.

5.7 Importance of passive access for international services
Viva also submit that wholesale passive access remedies are required in the critical routes connecting OLO’s PoPs and Cable Landing Stations (CLS) and at SE’s Optical Switching Nodes, as well as regulated collocation space and services at SE’s facilities.

a) PoP to CLS
When the TRA reviewed issues related to Batelco’s duct sharing reference offer in 2013 (Dominance Determination for Wholesale International Services, Final Determination, TRA 20 February 2013 (Ref: MCD/02/13/016) in the context of the Cable Landing Stations, it stated at paragraph 303 that:

"Regarding the various options available to OLOs for reaching the international cable landing points, the Authority remains of the view that access to Batelco ducts is an essential requirement to overcome barriers to entry into the wholesale market for the supply of international capacity from locations within Bahrain ..."

The TRA was optimistic that there would be a satisfactory outcome:
"While the Authority is empowered under Article 57(h) to issue regulations relating to Interconnection and Access requests and guidelines for the resolution of disputes, the Authority does not consider that it is necessary to do so at this stage, given the progress that has recently been made in opening up access to Batelco ducts which has enabled Licensed Operators to deploy their own fibre. While Viva and Zain have both submitted that further improvements are required to facilitate access to Batelco ducts, the Authority has monitored progress and has facilitated improved access in a number of ways, including the review of wholesale charges relating to duct access through the Reference Offer process and assisting in resolving the issue around lead-in ducts. The Authority will continue to monitor closely developments relating to duct access."

Viva submits that, six years later, this original optimism has proven to be unfounded. Viva remain subject to a sub-standard duct reference offer, at very high prices and no SLAs. The terms are not fair and reasonable and there is no evidence that they are non-discriminatory.

In the context of cable landing stations, major business customers require standalone services and diverse routes for contingency purposes. Carriers also require resilient routes and mega capacities to access international networks and services. This must be addressed through a fit-for-purpose duct reference offer.

b) Passive access and collocation at OSNs

OLOs should be entitled to collocate their active equipment at SE’s Optical Switching Nodes (OSN) and connect this equipment to the dark fibre connections achieved through passive access. Dark fibre could be used to connect the OLO’s PoPs or to larger OLO customers.

c) Interconnection and access

Accordingly, OLOs require interconnection and accommodation services from SE at its cable landing stations and OSNs for accessing SE’s products, including colocation space and services such as power and tie-cables.

These services also have a range of provisioning issues which raise wider competition and discrimination concerns where SE does not consume these products itself. Access to SE’s space requires an effective service level regime that addresses the timely provision or proactive management of this space by SE and this should be set out in the RO.

5.8 Consistency with a single NBN infrastructure

NTP4 provides that:

"Government considers that a single NBN infrastructure to deliver ultra-fast broadband products and services is preferable and efficient for a country of the size, population distribution and topology of Bahrain."

Article 40(bis) of the Telecommunications Law provides that OLOs "shall not deploy or maintain a fixed telecommunications infrastructure in the Kingdom, including in relation to the deployment and ownership of ducts and fibre optics". Viva believe that a wholesale dark fibre product is consistent with these requirements.

Article 40(bis) confirms that the SE’s privileged monopoly position will be as the only owner and operator of the duct and dark fibre network in the Kingdom. It does not preserve that monopoly over the higher layers and so OLOs and Batelco/BRE can deploy their own electronic equipment to light
up the dark fibre. If the TRA enables a monopoly for SE at layer 2, then this will implicitly be contrary to Article 40(bis).

Further, in the context of the Government’s reference to the particular size, population distribution and topology of Bahrain, it should be noted that in Singapore, a market with a similar geographic size to Bahrain and a quite small size population, NetLink Trust is now a provider of layer 1 dark fibre services and Nucleus Connect and others provide layer 2 services over the NGNBN. This demonstrates that a viable business case is available for a layer 1 and a layer 2 provider in countries of a similar size and population to Bahrain.

5.9 Importance of passive access for Batelco/BRE
Viva are concerned that Batelco/BRE may have found a way of acquiring passive access, other than from SE under the RO. This may account for the reason why there is no passive access products in the draft RO. For example:

- if Batelco/BRE jointly uses duct or dark fibre infrastructure, with SE; or
- if Batelco/BRE acquired passive access from SE, without that service also being available for OLOs.

If passive access is not available under the RO, this would be discriminatory, in breach of Article 57(b) of the Law, and would not be equivalent treatment, contrary to Paragraph 24(f) of NTP4. The TRA must prevent all non-equivalent “bypass” behaviour by Batelco/BRE.

5.10 Other issues

5.10.1 International examples of regulated passive access
There are many examples of other jurisdictions requiring wholesale dark fibre on regulated terms. Countries that have implemented passive access include France (dark fibre and duct), Singapore (dark fibre and duct), Netherlands (dark fibre) and New Zealand (dark fibre).

5.10.2 NTP4
The reference in NTP4 to SE’s wholesale products and services “reflect[ing] the reasonable requirements of all of the new entity’s wholesale customers”, must be read consistently with Article 57(e). Therefore, the reference to “reasonable requirements” is likely to mean the same as on fair and reasonable terms, as required by Article 57(e) of the Law.

The TRA does not have the discretion to relieve SE of the obligation to provide passive access, particularly dark fibre access. It can only consider whether the terms offered are fair and reasonable.

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Section 6: Non-price terms and conditions in the draft Reference Offer

The draft RO is inadequate in a number of respects:

6.1 Adequacy of the Service Level regime
- The service level regime proposed in the draft RO is lagging behind international best-practice benchmarks, such as the UK. This was accepted by the TRA when it approved Batelco’s current RO (despite Viva’s submissions at the time).
- The current United Kingdom service level regime for wholesale Ethernet services was summarised by Ofcom in the 2018 BCMR consultation document (Para 15.141) which allowed for compensation for delay. The RO fails short of this level of Service Credits (e.g.,
in the areas of (i) provisioning (under the draft RO would amount to 120% of MRCs - compared to 1,000% of MRCs in the UK); and (ii) fault repair (under the draft RO would amount to 250% of MRCs – compared to 645% of MRCs in the UK).

- There is also no consent required from OLOs for a prolonged delay in provisioning, as required by Ofcom in the UK.

6.1.1 Direct and indirect losses from poor quality of service
OLOs can suffer considerable direct and indirect losses (as defined in Viva’s main report) as a result of poor quality of service from the SE:
Viva are concerned that:
- the overall service level regime proposed in the draft RO, including the penalties, will not cover OLOs for the likely direct or indirect costs; and
- the service level regime will in fact mean that SE would not suffer any significant consequences from failing to meet those service levels.

6.1.2 Exposure to “gaming” by SE and Batelco
When an OLO’s customer is frustrated by failures in delivery or availability, they will often perceive the OLO as the cause of the problem or they perceive that the OLO is vulnerable to SE or Batelco gaming. In these cases, the customer is likely to consider Batelco/BRE as the “default” service provider, which means that Batelco/BRE has an “upside” from poor performance by SE, to compensate against any limited service credits SE has to pay to the OLO.

6.1.3 Ability to claim for damages
Service credits should not be the exclusive remedy for an OLO for service level failure. OLO should be entitled to seek damages (not currently permitted under the RO) in the event that the OLO’s losses exceed the caps. In both the United Kingdom with Openreach and in New Zealand with Chorus, service credits are not an exclusive remedy. Also, loss of profits of OLO’s should not be excluded where these are direct losses of the OLO (consistent with the position in the United Kingdom).

6.1.4 Planned outages
SE’s planned outages should not be taken into account when considering its performance against fault service levels. Under the draft RO, planned outages impact on availability service levels. Planned outages can be inappropriately used by SE in various ways to defeat the service level regime. An outage may be characterised as a planned outage when it is in fact triggered in response to network instability and so reduces SE’s exposure to service credits. Or, planned outages may be unreasonably long, again reducing SE’s exposure to service credits.

6.1.5 Demarcation
- SE must be responsible for the connection from the Point of Interconnection through the OLT and the ONT at the end-user’s premises or other access point, where SE is providing an active service. The AS or BRE would then provide service management (typically remotely from a service centre) across this connection to ensure that the end to end service is working correctly. If required, the ONT may be supplemented with a router which would be owned by the AS or BRE and would be mailed to the customer and installed by the customer.
- The end to end service testing would then be from the Broadband Network Gateway located in the AS or BRE facilities and the customer router. In this model, it should never be necessary for the AS or BRE to send a person to the customer’s premise, unless the customer wants assistance to implement a more complex network behind the ONT or router.
If a problem is encountered at the physical or bitstream layers, then the SE technician would be responsible for resolution.

- Where SE is providing a wholesale dark fibre service, SE must be responsible for the connection from an appropriate fibre distribution frame designated as a point of interconnection through the passive Network Terminating device located at the customer premise. It would then be the AS or BRE responsibility to install and test any active equipment that is required in conjunction with the dark fibre to deliver the end to end service for the customer. In this case, the AS or BRE is responsible for the layer 2 and above service integrity, while the SE is simply responsible for ensuring that there is a light path between the distribution frame and the customer termination point.

- Viva propose that AS shall procure single full fledge CPE (that has either ONT + LAN/WiFi, or xDSL+LAN/WiFi), to avoid having two different CPE at customer premises. SE will be given the required view credentials in order for the CPE to be integrated with the SE’s network, and provision the service where AS shall communicate their stock details with the SE upon handover in order for SE to whitenlist the CPEs when required within the Access network of SE. SE is expected to communicate back upon the installation to AS the following parameters for each service:
  - CPE MAC/Serial#
  - Order Number/Identifier for the user (SE service reference number)

6.1.6 Viva’s recommendations

- the run rate and caps should be brought up to the level in the United Kingdom;
- the reference offer should be changed so that Service Credits are no longer the OLO’s “sole, complete and final remedy” for non-performance (Clause 17.13, Schedule 9, Supply Terms). Instead, Service Credits should be without prejudice to any right of OLOs to claim for additional losses (e.g. waiving the monthly rental charge until the circuit has been free of further faults for a period of 12 months);
- a Service Credit should be introduced for persistent failure of a connection. Persistent, small failures (“flapping”, which results in the circuit being up and down rapidly) can cause end user disruption in the same way as a large, one-off failure;
- there should be a “ratchet” mechanism, so that higher levels of poor performance (which may be on an aggregated level) become subject to higher and higher levels of penalty. In these cases, the caps should not apply (see discussion in Viva’s main report for details on ratchet mechanism calculations);
- any planned outage should be announced at least three months in advance for major outages where OLOs have to be notified by SE communicating as much information as reasonably possible and conducted after midnight during off-peak hours for no more than 3 hours in total. If these requirements are not met, or if there are more than two planned outages per year, then Service Credits should apply; and
- the overall cap on liability for SE should be increased substantially to the UK levels to allow for the service credit regime to apply meaningful pressure on SE to perform.

6.2 Processes to support forecasting, ordering, provisioning and fault handling

6.2.1 Forecasting

- Viva propose removing entirely the linkage between forecasting and payment of service credits.
• Under the RO, OLOs are required to provide rolling quarterly 12-month forecasts on a monthly basis and there will be no service credit if actual service requests are less than 70% of the OLO's forecast or greater than 130% - this tight reliance on a long-term forecast is inappropriate as the SE will have the largest dataset overall and, although it may not know what a particular OLO's demand is likely to be, it has the best view of the market as a whole.
• OLOs have less visibility of the market yet substantial adverse consequences if its forecast is inaccurate. The service credits, which are required to ensure that SE meets the delivery service levels, will turn out to be no incentive whatsoever if the OLO is inaccurate in its forecasting.

6.2.2 Ordering
• To deliver an automated service ordering process (to ensure that the volume of orders produced by all retail service providers can be addressed in an orderly and timely manner) the SE must develop an online portal to replace the suggested manual process in the draft RO, whereby OLOs will submit their orders (either new installations, change requests or troubleshooting) electronically.
• At the SE side, this portal should be integrated with its provisioning/CRM platforms. Viva believes that such portal could be developed within a period of maximum 2 months.
• Viva considers the proposed automated ordering process is essential to prevent BRE enjoying a discriminatory position being integrated with the SE's CRM platform. In case an automated system is not imposed on the SE, BRE ordering process should follow the same proposed manual process. All service requests received by SE should will be processed by SE in the order in which they are received (with provisions around deemed acceptance, reasons for rejection, provision of assistance and notification date penalties – as set out in Viva’s main report).

6.2.3 Provisioning
a) VIP installation
AS's should be able to require that installation for enterprise customers be undertaken by SE’s VIP installation team if requested by ASs and this should be at no additional cost to ASs.

b) Expected RFT Date
Viva suggest that any Expected RFT Date must specify either morning or afternoon and provide the OLO with a 2 hours' time window to be present at the end-user site. The SE technician must attend the premises during working hours and at least have called the AS representative if it appears that the AS or end user are not present at the relevant time (and be able to provide evidence of this).

c) Next available date
SE must notify the AS of the next available dates where it is not in a position to meet the Expected RFT Date. As SE are incentivised to make the first available date as soon as possible after the scheduled date, but there is no requirement to offer up any alternative later dates, the next available date must be no later than 2 working days after the original scheduled date. The process should also state how much notice SE must give of its inability to meet the Expected RFT Date.

6.2.4 Fault management
• Pro-active notification of faults
The Actual Fault Acknowledgement Time begins when AS notifies SE of a fault, but SE should be required to pro-actively notify the AS of a fault when it discovers it, whether or not first notified by the AS. As soon as SE becomes aware of the fault, for whatever reason, this should signal the commencement of the Actual Response Time and Actual Restoration Time periods.
• **Dispute resolution process**
  Where there is a dispute over whether SE has provided the requisite proof that the connection is performing in accordance with the QoS Parameters, then the AS’s decision should be given effect to and that, if the dispute is resolved in favour of SE, the AS refund to SE any service credits that are applicable, plus interest.

• **Responsibility of AS or end-user**
  Under the RO, SE will not be liable if certain “exceptional circumstances” arise; including “events either caused by or which are under the reasonable control of the AS or its retail end-customer”. The TRA needs to address the risk this creates of the SE absolving responsibility so as to remove or reduce its liability for service credits by clearly setting out the areas that fall within SE’s responsibility and those within the AS’s responsibility.

• Further, all exceptional circumstances should be evidenced by the SE and presented to ASs/TRA upon request.

• **Additional activities**
  SE should also conduct other additional activities following a service level failure, including:
  • performing a root-cause analysis;
  • creating and implementing a remediation plan; and
  • updating the AS of the cause and the steps being taken to remedy the fault.

• Any restoration outside working hours should be free of charge as ASs are already paying for the service.

• SE should develop a gateway interface to provide a fault placement and tracking system to OLOs to report, follow-up and view the performance of the SE’s SLA.

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**Section 7: Price terms and conditions**

7.1 **Introduction**
Viva have not seen SE’s business plan for 2019.

7.2 **Requirements under the Law**
- In relation to Article 57(e), the TRA must ensure that SE’s prices under the RO are “fair, reasonable and non-discriminatory and the tariffs shall be based on forward-looking incremental costs or by benchmarking such tariffs against tariffs in comparable Telecommunications markets”.

- The TRA must consider whether its proposed multi-year price control is consistent with Article 57(b).

- Further, the TRA is proposing to “ensure that prices included in the Separated Entity’s RO are consistent with moving towards such a framework. The Authority will seek to do this by reviewing the impact of pricing proposals on the overall return for the Separated Entity forecast in its business plan for 2019”. Again, if the prices are “consistent with moving towards” a multi-year model, but are not based on forward-looking incremental costs or appropriate benchmarks, then the TRA will not be complying with Article 57(b).

7.3 **Need for a cost or benchmarking study**
• The TRA must conduct an exercise to assess SE’s forward-looking incremental costs or benchmark against tariffs in comparable telecommunications markets – due to time constraints, the TRA should conduct an international benchmarking study.

• In section 7.4 of its main report, Viva have provided examples of benchmarking by comparing the prices of some of SE’s key products and services with prices in New Zealand, Australia, Germany and the United Kingdom.

Prices for WLA and WDC products

• The proposed prices for WLA and WDC products are very high in relation to other alternative solutions, such as point-to-point fixed microwave link fees (see examples in Viva’s main report).

• This disparity suggests that the TRA needs to more closely examine the WLA and WDC charges, with a view to bringing them into line with alternative solutions.

Section 8: Reference Offer review process

• The TRA states that it will work with all stakeholders in the market to identify further amendments through a regular review process (post RO publication) – the first such review will take place within 18 months of publication of the RO.

• The TRA needs to be aware that any review process is not a way of providing a gradual transition for SE, before it is subject to Access that it has to provide under the Law.

• Although it refers to Interconnection, Article 57(b) requires 6 monthly updates of the RO. The Access Regulations, similarly, require 6 monthly updates.

Annex 1

Service Terms

• Clause 3.1: The BPS is only ‘available to residential mass market End Users and not business customers’. SE should provide the BPS service to business end-users.

• Clause 3.2: SE implements in batches of 10 Service Requests. There should be no specific limit on batches.

• Clause 3.4: the Minimum Service Period should be 1 month. At the end of clause 3.4, the equivalent provision in the WBS SD (clause 3.2) says “The Access Seeker shall not be liable to pay liquidated damages if the cancellation was directly caused by a breach by SE of one or more of its WBS obligations”. This wording should be reinstated in clause 3.4.

• Clauses(s) 3.4 and 3.5: Viva requests to mandate on SE to notify the AS 24 months in advance prior ceasing the WBS. The same applies to the Bitstream Plus service.

• Clauses 3.4 3.5 and 3.6: any action should require the prior consent of the TRA.

• In the equivalent provision in the WBS SD (clause 3.3), SE needs to give 20 Business Days prior written notice to the AS to remedy the breaches. It also only applies to material breach, whereas clause 3.6 applies to any breach. The BPS should be realigned with the language in the WBS SD.

• Clause 3.8: the equivalent provision in the WBS SD (clause 3.5) requires material breaches, with 20 Business Days written notice to the AS. The BPS should be realigned with the language in the WBS SD. Again, this should require the prior consent of the TRA.
End User Access

- **Clause 4.1:** it requires that “SE supplies operational (already active fixed line number over GPON) standard telephone services to the same End User over the same Useable Line”. However, SE does not provide any standard telephone services to End Users. Further, there is no reason why there should be this linkage.

- **Clause 4.3:** the equivalent provision in the WBS SD requires (for suspension and termination) that the AS be at fault. This is not a requirement for clause 4.3 and the wording should be realigned. Numerous other indemnified events are included, that are not included in the WBS SD and these should be removed.

- **Clause 4.6:** SE should be required to provide a map for all areas in Bahrain covered by BPS and the max speed supported per address (i.e. building, road, block) & the connection type (Copper or Fibre) to ensure that the right communication is offered to the end user. This map should be updated and communicated to AS on a monthly basis. It should be feasible to deploy a Bitstream connection even if the connection is copper.

Maintenance

- **Clause 5.1:** the equivalent provision in the WBS SD (clause 5.1) provides that the QoS and availability is the same as “provided for the equivalent TBS service elements supplied to Batelco retail”, whereas clause 5.1 says “as SE provides to itself for the same or equivalent network elements”. The wording should be realigned with the WBS SD.

Equipment

- **Clause 6.2:** the WBS SD requires that equipment be approved under Article 38 of the Law. Whereas clause 6.2 just says “approved equipment”. It should be clear that approval is given by the TRA.

Connection

- **Clause 7.2:** contains an indemnity that is not included in the WBS SD, relating to allocation of IP addresses and allocation and management of domain names. There should be no need for such an indemnity.
Appendix 2

Zain’s Submissions - Extracts

Zain's response to RO Consultation Questions 8, 9 and 10:

- The reference to “passive access products” is broad and generic – define what applications and portion of network connectivity passive elements are to be considered as pre-requisites for the service delivery of current and future retail products.

- E.g. It would be necessary to consider the technology evolution of radio access network architecture which now calls for a new application of fibre connectivity to reduce latency. The use of optical fibre cables will no longer be limited to the connection of the base station infrastructure to the core network – traditionally called “backhaul”. Instead, optical fibres will also be used to connect “distributed radio units” consisting on a centralised baseband controller and stand-alone radio heads installed in remote radio cell sites located tens of metres away. This is called “fronthaul”.

- The next generation of wireless systems will employ Centralized Radio Access Network (“C-RAN”) which enables the separation of the wireless system into two parts, Central Unit (“CU”) and Distributed Units (“DU”).
  - The CU controls the DUs and can control multiple DUs simultaneously. Moreover, the CU processes data to/from DUs and handles co-ordination control functions between DUs.
  - A DU consists of an antenna and a Remote Radio Head (“RRH”). The separation of the digital processing capabilities (i.e. CU) from the RRH reduces the equipment footprint at the cell site and allows for more efficient network operations. In this radio architecture, the connection between the CU and RRH must be provided over fibre-optic cable.
  - This fibre uses Common Public Radio Interface (“CPRI”) to replace the legacy coax cable connection between a radio transceiver (used example for mobile-telephone communication and typically located in a tower) and a base station (typically located at the ground nearby), so the connection can be made to a remote and more convenient location.
  - This “fronthaul” network connection has to be a passive cable due to the High bandwidth requirements (10 – 25 Gbps); Stringent latency requirements (<75 microseconds); and Impractical to host active equipment in micro-sites.

Given the nature and the expected applications of 5G radio access technology, Zain anticipate large deployments of micro-sites that would require the use of passive fibre connectivity.
- Operators will face a major challenge to build a unified network to meet the transport requirements of various 5G services (required high requirements for bandwidth, latency and network flexibility).

- Optical Transport Network (OTN, i.e. lambda) combines the advantages of optical transmission and electrical processing to provide end-to-end transparent connectivity, and large bandwidth capabilities. OTN guarantees strict isolation of different services and service bandwidths, a shortcoming of the carrier Ethernet transmission. Furthermore, OTN’s comprehensive mechanism for operation, administration, and maintenance ("OAM") at a bit-level, ensures high service quality and facilitates network operation and maintenance.

- OTN network’s advantages include flexibility (enable operators to employ technologies they need now while enabling adoption of new technologies as business requirements dictate); latency (an all optical
network that uses static multiplexing to overcome buffer delays; scalability (an OTN network can provide multiple Tb/s of bandwidth through WDM technology); and better Security (OTN networks ensure high level of privacy and security through hard partitioning of traffic onto dedicated lambdas).

- 5G radio access networks will also impose stringent latency and capacities requirement on backhaul systems. Given the anticipated data traffic generated, current network deployment of mobile operators (other than BRE), the available MBS product would be insufficient to accommodate future OLO needs and a superior backhaul solution is a must to address this requirement (expected to be due within six months to nine months from RO issuance date) (please refer to the UBS technical diagrams which Zain presented and discussed during the Zain-TRA workshop on 16 January 2019). These include obliging the SE to provide:
  - **End-to-end Lambda**: connectivity structured as one lambda terminated at SE’s provided OTN located in mobile operator’s radio site. This represents a fully active service.
  - **Core Lambda**: a passive link from its nearest exchange to mobile operator’s radio site, and to provide collocation for the mobile operator’s OTN in its exchanges connected to SE’s OTN at lambda level to backhaul the aggregated traffic of the exchange. In this solution, only core links represent fully active links.
  - **Fibre unbundling**: a passive link from its nearest exchange to mobile operator’s radio tower and provide collocation for mobile operator’s OTN in its exchanges. The SE will provide a single fibre pair to connect mobile operator’s OTN collocated in the SE exchanges. This represents a fully passive solution.

(In the first two scenarios, the mobile operators share the same fibre but maintain separate connectivity by using separate transmission wavelengths, i.e. wavelength division multiplexing (WDM)).

**Note**: Maintaining a lower connectivity layer provides the mobile operator network with the following advantages:

- Innovation and flexibility: mobile operators will have full control over the traffic routing, adoption of new technologies as business requirements dictate and interoperability; and

- Expansion and replacement cost: because the proposed optical topology solution is a fully transparent protocol, adapting existing services is straightforward and leaves current network deployments intact. The enhanced multiplexing capabilities of the optical network allow for different traffic types to be carried over a single wavelength. Therefore, the cost of expansion or replacing network components whenever new technologies emerge is significantly minimised.

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