A draft Order issued by the Telecommunications Regulatory Authority on the Reference Offer of the Bahrain Telecommunications Company B.S.C

Draft Order on the Reference Offer of Batelco

15 December 2015
Ref: MCD/12/15/092

Public Version

(Confidential information has been replaced by [X])

Request for comments:
The Telecommunications Regulatory Authority invites comments on this draft Order from all interested parties. Comments should be submitted before 4 February 2016 at 4pm.

Responses should be sent to the Authority preferably by e-mail (or by fax or post) to the attention of:

Market and Competition Department
MCD@tra.org.bh
Telecommunications Regulatory Authority
P.O. Box 10353, Manama, Kingdom of Bahrain
Fax: +973 1753 2125

Purpose: to set the fair, reasonable and non-discriminatory price and non-price terms of the regulated wholesale products and services in Bahrain Telecommunications Company B.S.C’s Reference Offer.
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Instructions for submitting a response

The Telecommunications Regulatory Authority ("the Authority") invites comments on this draft Order from all interested parties. Comments should be submitted by 4 February 2016 at 4pm.

Responses should be sent to the Authority preferably by email (or by fax or post) to the attention of:

Market and Competition Department
MCD@tra.org.bh
Telecommunications Regulatory Authority
P.O. Box 10353, Manama, Kingdom of Bahrain
Fax: +973 1753 2125

Responses should include:

- the name of the company/institution/association etc.;
- the name of the principal contact person;
- full contact details (physical address, telephone number, fax number and e-mail address); and
- in the case of responses from individual consumers, name and contact details.

The Authority expects the comments to follow the same order as the ones set out in this draft Order. The Authority also invites respondents to substantiate their responses to the questions included in this document. The consolidated list of such questions can be found in the Annex E of this document.

In providing their comments, respondents are requested to use the template provided with the consultation document.¹

Respondents are required to mark clearly any information included in their submission that is considered confidential. Where such confidential information is included, respondents are required to provide both a confidential and a non-confidential version of their submission (soft copies and not scanned copies). If a part or a whole submission is marked confidential, reasons should be provided.

The Authority will evaluate a request for confidentiality in line with relevant legal provisions and the Authority's published guidance on the treatment of confidential and non-confidential information.²

In the interest of transparency, the Authority will allow one round of cross-submissions, where respondents who provided a submission on the draft Order are able to provide a cross-submission in which they can comment on the submissions of other parties. The Authority may

¹ See “Response template.docx”
specify the scope of issues to be addressed as part of the cross-submissions and, in such case, will not consider comments on topics that have not been raised by the Authority in its invitation for cross-submissions. The Authority will also ensure that public versions of the submissions are available on the Authority’s website with sufficient time to permit cross-submissions.

Once the Authority has received and considered all the comments raised by respondents in their submissions and cross-submissions (if any), the Authority will issue its final Order.
REFERENCE OFFER [DRAFT] ORDER ON BAHRAIN TELECOMMUNICATIONS COMPANY B.S.C. (the “Batelco Order”)

1. Pursuant to:
   a. The exercise of its powers under article 3(c)(1), 57(b) and 57(e) of Legislative Decree No. 48 for the year 2002 promulgating the Telecommunications Law (the ‘Law’), and articles 2,3,4,5 and 6 of the Access Regulation issued on 30 April 2005 (the ‘Access Regulation’).
   c. The legal basis and reasoning set out in Annex A to this Batelco Order. Annex A forms an integral part of this Batelco Order.

Price terms of regulated wholesale products and services

2. The Telecommunications Regulatory Authority (the “Authority”) hereby orders the price terms as detailed in the following table to be implemented by Bahrain Telecommunications Company B.S.C (“Batelco”) in its Reference Offer (“RO”).

3. For the avoidance of doubt, the ordered price terms apply to all new and existing regulated wholesale products and services.
### Figure 1: Table listing the Authority’s ordered price terms

<table>
<thead>
<tr>
<th>Chargeable activity</th>
<th>TRA’s draft Order FRND charges</th>
<th>Currently implemented charges</th>
<th>Difference (in %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wholesale Local Access (&quot;WLA&quot;) – Monthly Recurring Charge (&quot;MRC&quot;)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Low-speed WLA Connections (copper-based)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>64 kbit/s</td>
<td>58.508</td>
<td>58.508</td>
<td>0.0%</td>
</tr>
<tr>
<td>128 kbit/s</td>
<td>60.963</td>
<td>60.963</td>
<td>0.0%</td>
</tr>
<tr>
<td>256 kbit/s</td>
<td>64.600</td>
<td>65.872</td>
<td>-1.9%</td>
</tr>
<tr>
<td>512 kbit/s</td>
<td>67.700</td>
<td>75.692</td>
<td>-10.6%</td>
</tr>
<tr>
<td>1 Mbit/s</td>
<td>73.800</td>
<td>97.143</td>
<td>-24.0%</td>
</tr>
<tr>
<td>2 Mbit/s</td>
<td>86.300</td>
<td>138.879</td>
<td>-37.9%</td>
</tr>
<tr>
<td><strong>High-speed WLA Connections (fibre-based)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 Mbit/s</td>
<td>134.900</td>
<td>259.927</td>
<td>-48.1%</td>
</tr>
<tr>
<td>8 Mbit/s</td>
<td>163.500</td>
<td>344.053</td>
<td>-52.5%</td>
</tr>
<tr>
<td>10 Mbit/s</td>
<td>175.300</td>
<td>380.519</td>
<td>-53.9%</td>
</tr>
<tr>
<td>15 Mbit/s</td>
<td>200.900</td>
<td>462.398</td>
<td>-56.6%</td>
</tr>
<tr>
<td>20 Mbit/s</td>
<td>223.100</td>
<td>535.482</td>
<td>-58.3%</td>
</tr>
<tr>
<td>25 Mbit/s</td>
<td>243.200</td>
<td>602.652</td>
<td>-59.6%</td>
</tr>
<tr>
<td>50 Mbit/s</td>
<td>325.400</td>
<td>888.095</td>
<td>-63.4%</td>
</tr>
<tr>
<td>75 Mbit/s</td>
<td>392.300</td>
<td>1,127.512</td>
<td>-65.2%</td>
</tr>
<tr>
<td>100 Mbit/s</td>
<td>450.900</td>
<td>1,341.209</td>
<td>-66.4%</td>
</tr>
<tr>
<td>150 Mbit/s</td>
<td>553.600</td>
<td>1,721.257</td>
<td>-67.8%</td>
</tr>
<tr>
<td>200 Mbit/s</td>
<td>644.100</td>
<td>2,060.482</td>
<td>-68.7%</td>
</tr>
<tr>
<td>300 Mbit/s</td>
<td>803.100</td>
<td>2,663.772</td>
<td>-69.9%</td>
</tr>
<tr>
<td>400 Mbit/s</td>
<td>943.500</td>
<td>3,202.255</td>
<td>-70.5%</td>
</tr>
<tr>
<td>500 Mbit/s</td>
<td>1,071.700</td>
<td>3,697.169</td>
<td>-71.0%</td>
</tr>
<tr>
<td>1,000 Mbit/s</td>
<td>1,610.600</td>
<td>5,800.336</td>
<td>-72.2%</td>
</tr>
<tr>
<td><strong>WLA Aggregation Links (fibre-based)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WLA Aggregation Link (1GbE; fibre-based)</td>
<td>200.000</td>
<td>200.000</td>
<td>0%</td>
</tr>
<tr>
<td><strong>Premium Support for WLA Connections</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Charge premium for the “Premium Support” of a WLA Connection</td>
<td>Additional 20% premium on top of the applicable MRC for the Connection</td>
<td>n/a</td>
<td></td>
</tr>
<tr>
<td>Free for Connection with end-to-end physical and logical protection</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>End-to-end physical and logical protection for WLA Connections</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Charge premium for the end-to-end physical and logical protection of a WLA Connection</td>
<td>Additional 30% premium on top of the applicable MRC for the Connection</td>
<td>n/a</td>
<td></td>
</tr>
<tr>
<td><strong>WLA – Non Recurring Charge (&quot;NRC&quot;)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Installation and configuration charge for ‘soft’ change request</td>
<td>50.000</td>
<td>50.000</td>
<td>0.0%</td>
</tr>
<tr>
<td>Installation and configuration charge for ‘hard’ change request – 64 and 128 kbit/s</td>
<td>150.000</td>
<td>150.000</td>
<td>0.0%</td>
</tr>
<tr>
<td>Chargeable activity</td>
<td>TRA’s draft Order FRND charges</td>
<td>Currently implemented charges</td>
<td>Difference (in %)</td>
</tr>
<tr>
<td>------------------------------------------------------------------------------------</td>
<td>-------------------------------</td>
<td>-------------------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>Installation and configuration charge for ‘hard’ change request – 256 and 512 kbit/s</td>
<td>200.000</td>
<td>200.000</td>
<td>0.0%</td>
</tr>
<tr>
<td>Installation and configuration charge for ‘hard’ change request – 1 Mbit/s</td>
<td>250.000</td>
<td>250.000</td>
<td>0.0%</td>
</tr>
<tr>
<td>Installation and configuration charge for ‘hard’ change request – 2 Mbit/s</td>
<td>300.000</td>
<td>300.000</td>
<td>0.0%</td>
</tr>
<tr>
<td>Installation and configuration charge for ‘hard’ change request – 4 Mbit/s to 1,000 Mbit/s</td>
<td>400.000</td>
<td>400.000</td>
<td>0.0%</td>
</tr>
<tr>
<td>Installation and configuration charge for ‘hard’ change request – Aggregation Link</td>
<td>Time and materials</td>
<td>Time and materials</td>
<td></td>
</tr>
</tbody>
</table>

**Wholesale Data Connection (“WDC”) – Monthly Recurring Charge (“MRC”)**

<table>
<thead>
<tr>
<th>WDC Connections (fibre-based)</th>
<th>MRC in BD</th>
</tr>
</thead>
<tbody>
<tr>
<td>45 Mbit/s (or DS3)</td>
<td>352,700</td>
</tr>
<tr>
<td>156 Mbit/s (or STM-1)</td>
<td>535,200</td>
</tr>
<tr>
<td>300 Mbit/s</td>
<td>713,400</td>
</tr>
<tr>
<td>400 Mbit/s</td>
<td>812,100</td>
</tr>
<tr>
<td>500 Mbit/s</td>
<td>901,900</td>
</tr>
<tr>
<td>622 Mbit/s (or STM-4)</td>
<td>1,003,000</td>
</tr>
<tr>
<td>750 Mbit/s</td>
<td>1,113,300</td>
</tr>
<tr>
<td>1,000 Mbit/s</td>
<td>1,289,600</td>
</tr>
<tr>
<td>1,250 Mbit/s</td>
<td>1,450,500</td>
</tr>
<tr>
<td>1,500 Mbit/s</td>
<td>1,600,300</td>
</tr>
<tr>
<td>2,000 Mbit/s</td>
<td>1,875,400</td>
</tr>
<tr>
<td>2,500 Mbit/s (or SMT-16)</td>
<td>2,127,000</td>
</tr>
<tr>
<td>5,000 Mbit/s</td>
<td>3,366,500</td>
</tr>
<tr>
<td>7,500 Mbit/s</td>
<td>4,249,000</td>
</tr>
<tr>
<td>10,000 Mbit/s (or SMT-64)</td>
<td>5,033,500</td>
</tr>
</tbody>
</table>

**WDC Aggregation Link (fibre-based)**

<table>
<thead>
<tr>
<th>WDC Aggregation Link (10 GbE/STM-64; fibre-based; including end-to-end physical and logical protection)</th>
<th>MRC in BD</th>
</tr>
</thead>
<tbody>
<tr>
<td>500.000</td>
<td>n/a</td>
</tr>
</tbody>
</table>

**Premium Support for WDC Connections**

<table>
<thead>
<tr>
<th>MRC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Additional 20% premium on top of the applicable MRC for the Connection</td>
</tr>
<tr>
<td>Free for Connection with end-to-end physical and logical protection</td>
</tr>
</tbody>
</table>

**End-to-end physical and logical protection for WDC Connections**

<table>
<thead>
<tr>
<th>MRC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Additional 30% premium on top of the applicable MRC for the Connection</td>
</tr>
</tbody>
</table>

**WDC – Non Recurring Charge (“NRC”)**

<table>
<thead>
<tr>
<th>MRC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Installation and configuration charge for ‘soft’ change request</td>
</tr>
<tr>
<td>Installation and configuration charge for ‘hard’ change request – 45 Mbit/s to 10,000 Mbit/s</td>
</tr>
</tbody>
</table>
### Chargeable activity

<table>
<thead>
<tr>
<th>Installation and configuration charge for ‘hard’ change request – Aggregation Link</th>
<th>TRA’s draft Order FRND charges</th>
<th>Currently implemented charges</th>
<th>Difference (in %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time and materials</td>
<td>Time and materials</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Other wholesale services

<table>
<thead>
<tr>
<th>#</th>
<th>Chargeable activity</th>
<th>TRA’s draft Order FRND charges</th>
<th>Currently implemented charges</th>
<th>Difference (in %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1-7.1 – Conveyance of emergency call to 999</td>
<td>5.403</td>
<td>1.233</td>
<td>338%</td>
</tr>
<tr>
<td>2</td>
<td>1-7.2 – Conveyance of emergency call to 990</td>
<td>5.403</td>
<td>2.711</td>
<td>99%</td>
</tr>
<tr>
<td>3</td>
<td>1-7.3 – Conveyance of emergency call to 992</td>
<td>5.403</td>
<td>2.711</td>
<td>99%</td>
</tr>
<tr>
<td>4</td>
<td>1-7.4 – Conveyance of emergency call to 994</td>
<td>5.403</td>
<td>2.711</td>
<td>99%</td>
</tr>
<tr>
<td>5</td>
<td>1-7.5 – Conveyance of emergency call to 998</td>
<td>5.403</td>
<td>2.711</td>
<td>99%</td>
</tr>
<tr>
<td>6</td>
<td>2-2.1 – Directory assistance service for call to 181</td>
<td>186.970</td>
<td>112.684</td>
<td>66%</td>
</tr>
<tr>
<td>7</td>
<td>2-2.2 – Directory assistance service for call to 188</td>
<td>186.970</td>
<td>112.800</td>
<td>66%</td>
</tr>
<tr>
<td>8</td>
<td>2-9.1 – Inter-Operator Transit Access Service: Per Transit Call</td>
<td>1.551</td>
<td>1.723</td>
<td>-10%</td>
</tr>
<tr>
<td>9</td>
<td>2-13.7 – CPS Call Origination</td>
<td>2.826</td>
<td>3.600</td>
<td>-22%</td>
</tr>
<tr>
<td>10</td>
<td>2-13.8 – CPS Cost recovery surcharge</td>
<td>0.000</td>
<td>4.200</td>
<td>-100%</td>
</tr>
</tbody>
</table>

* Price ceilings applicable to high-speed CAT and LLCO circuits

**Source:** The Authority

### Non price terms of regulated wholesale products and services

4. The Authority hereby orders the following non-price terms as detailed in the following table to be implemented by Batelco in its RO:

**Figure 2:** Table listing the Authority’s ordered non-price terms

<table>
<thead>
<tr>
<th>#</th>
<th>Section in Annex A</th>
<th>Paragraphs with ordered non-price terms</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2. General amendments to the RO</td>
<td>paragraph 38</td>
<td>page 18</td>
</tr>
<tr>
<td>2</td>
<td>2. General amendments to the RO</td>
<td>paragraph 40</td>
<td>page 19</td>
</tr>
<tr>
<td>3</td>
<td>2. General amendments to the RO</td>
<td>paragraph 44</td>
<td>page 19</td>
</tr>
<tr>
<td>4</td>
<td>2. General amendments to the RO</td>
<td>paragraph 47</td>
<td>page 20</td>
</tr>
<tr>
<td>5</td>
<td>5. Review of non-price terms applicable to wholesale data connectivity products and services</td>
<td>paragraph 169</td>
<td>page 61</td>
</tr>
<tr>
<td>6</td>
<td>5. Review of non-price terms applicable to wholesale data connectivity products and services</td>
<td>paragraph 198</td>
<td>page 69</td>
</tr>
<tr>
<td>7</td>
<td>5. Review of non-price terms applicable to wholesale data connectivity products and services</td>
<td>paragraph 205</td>
<td>page 71</td>
</tr>
<tr>
<td>8</td>
<td>5. Review of non-price terms applicable to wholesale data connectivity products and services</td>
<td>paragraph 209</td>
<td>page 71</td>
</tr>
<tr>
<td>9</td>
<td>5. Review of non-price terms applicable to wholesale data connectivity products and services</td>
<td>paragraph 222</td>
<td>page 75</td>
</tr>
<tr>
<td>10</td>
<td>5. Review of non-price terms applicable to wholesale data connectivity products and services</td>
<td>paragraph 231</td>
<td>page 76</td>
</tr>
</tbody>
</table>
Draft Order on the Reference Offer of Batelco
REFERENCE OFFER [DRAFT] ORDER

<table>
<thead>
<tr>
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Source: the Authority

Entry into force

5. This Batelco Order is effective on the date of its issuance.

6. Within 7 calendar days following the date of issuance of this Batelco Order, Batelco shall notify via email all its wholesale customers copying the Authority of the new ordered price terms and the new ordered non-price-terms, including their effective implementation date which shall not be later than 60 calendar days following issuance of this Batelco Order.

7. Within 60 calendar days from the date of issuance of this Batelco Order:
   a. Batelco shall reflect the ordered price terms and ordered non-price terms in its RO by amending the relevant RO schedules;
   b. Batelco shall, before the effective implementation date, make available on its website ‘marked-up’ and ‘unmarked’ versions of the RO; and
   c. Batelco shall promptly thereafter notify via email all its wholesale customers copying the Authority of the RO publication.

8. Batelco shall ensure that the ‘marked-up” versions of RO schedules reflecting ordered price terms and ordered non-price terms remain available on its website for a minimum period of three (3) calendar months following the publication of the RO.

9. This Batelco Order is without prejudice to any further orders, regulations and determinations that the Authority may consider necessary pursuant to its powers and duties under the Law.
Compliance

10. Batelco shall comply with the terms of this Batelco Order. Failure to comply with the terms of this Order may constitute a material breach of the Law and may consequently be subject to enforcement action pursuant to the relevant provisions of the Law.

Signed on [Day Month Year]

[●]
Mohammed Bubashait
General Director
Telecommunications Regulatory Authority
Manama, Kingdom of Bahrain
Annex A – Draft Order Legal Basis and Reasoning

1 Introduction

CONSULTATION TEXT

1.1 Preamble

11. Batelco’s Reference Offer (‘RO’) is a key regulatory instrument that underpins competition in the telecommunications markets in the Kingdom of Bahrain. It affects Batelco and other operators. Accordingly, the Authority will consult with the wider industry and stakeholders on this draft Order.

12. This Annex provides the context and chronology of this review of Batelco’s 2014 RO submission. It contains the legal basis of the decisions the Authority has made in this draft Order. It sets out, furthermore, the interpretation of fair, reasonable and non-discriminatory price and non-price terms, which the Authority is required by law to apply when determining the level of the regulated charges.

1.2 Legal basis

13. Article 57 of Legislative Decree No. 48 of 2002 promulgating the Telecommunications Law (the “Law”) and article 4 of the Access Regulation issued 30 April 2005 requires an operator, that has been determined by the Telecommunications Regulatory Authority (the “Authority”) to be in a Dominant Position in a particular telecommunications market, to publish a RO that has been approved by the Authority. A RO sets out the terms, conditions and tariffs for regulated wholesale services that the dominant operator is required to supply to Other Licensed Operators (“OLO”).

14. Article 57 of the Law and articles 5 and 6 of the Access Regulation requires that the terms and conditions and tariffs are fair, reasonable, and non-discriminatory, and that the tariffs are based on forward-looking costs or benchmarked against tariffs in comparable telecommunications markets. When doing so, the Authority shall:

   a. pursuant to article 3(a) of the Law, carry out its duties and exercise its powers efficiently, effectively, reasonably, and in a non-discriminatory and transparent manner.

   b. pursuant to article 3(b) of the Law, ensure that when assessing such terms or tariffs, it will carry out its duties in a manner best calculated to:

      i. protect the interests of Subscribers or Users in respect of:

         - the tariffs charged for services
         - availability and provision of service
         - protection of personal information and privacy of services; and
i. promote effective and fair competition among new and existing Licensed Operators.

15. Furthermore, in accordance with article 57 of the Law, should the Authority consider that that the terms and conditions and tariffs are not fair, not reasonable, and are discriminatory, or that the tariffs are not based on forward-looking costs or benchmarked against tariffs in comparable telecommunications markets, then the Authority may issue an Order specifying the terms, conditions and tariffs.

16. Bahrain Telecommunications Company B.S.C. (‘Batelco’), has been found to have a Dominant Position in the relevant markets identified in the following determinations:

a. the Dominance in Interconnection Markets Determination issued 9 August 2003 (ref: ERU/DE/005);

b. the Dominance Determination in the wholesale market for termination services on Batelco mobile network in the Kingdom of Bahrain issued on 1 February 2010 (ref: MCD/02/10/010);

c. the Dominance Determination in the wholesale physical network infrastructure access market and in the wholesale broadband access market for the supply of business broadband internet access services from a fixed location issued on 27 March 2014 (ref: MCD/03/14/018); and

d. the Dominance Determination in the wholesale market for the supply of domestic data connectivity services in Bahrain, with the exception of Amwaj Islands issued on 10 April 2014 (ref: MCD/04/14/026).

17. As a result of having been found dominant in relevant markets identified in the above determinations, and pursuant to Article 57 of the Law, Batelco has been required to make a RO available to OLOs for regulated wholesale services.

18. Batelco made a submission on 16 October 2014 with respect to changes to its RO. In its submission, Batelco proposed amendments to some of the RO terms, conditions and tariffs. This RO submission has been made to the Authority for its review and approval. In response, this draft Order presents the Authority’s initial views with respect to whether or not Batelco’s proposals as presented in its RO submission comply with Article 57 of the Law. Furthermore, this draft Order includes the Authority’s views on additional matters to be addressed that would bring the RO into compliance with Article 57 of the Law.
1.3 RO review process

19. In its letter dated 19 May 2014 (ref: MCD/05/14/062) to Batelco, the Authority set out the following requirements, which in accord with the Telecommunications Law, are to facilitate the RO review process. Batelco is to:

   a. Document and justify its proposed RO tariffs in light of the relevant legal provisions, including article 57 of the Telecommunications Law;

   b. Provide at the time of submission all supporting documents, particularly fully functioning and documented spreadsheets to enable the Authority to follow the calculations as well as to ensure consistency and accuracy of the figures and data provided;

   c. Explain and justify in its written submission any changes to previously agreed and ordered positions;

   d. Provide comparison with 2011 and 2012 cost stacks, when appropriate and relevant, in order to explain changes in costs for services over time and whether proposed tariffs are based on forward looking costs; and

   e. Meet with the Authority to present all submitted documents.

20. On 16 October 2014, Batelco submitted its RO based on 2012 regulatory costs for the Authority’s review (Batelco’s reference GCL/389/14).


23. Where Batelco has not provided any justification or new arguments to support departures from a position taken in the previous RO Order, the Authority has reverted to its previous position. Where the Authority, furthermore, has departed from a previous position, the reasons for doing so are set out in this draft Order.
1.4 Fair, reasonable and non-discriminatory terms, conditions and tariffs

24. The Authority considers access tariffs to be fair and reasonable if such tariffs are based on relevant, efficiently incurred economic costs calculated on a forward-looking incremental basis, including the regulated rate of return on capital employed.

25. After having conducted a review of the tariffs contained in the initial RO submission, and the additional information considered necessary by the Authority to complete its analysis, the Authority deems that certain terms listed in the initial RO submission are unfair, unreasonable and/or discriminatory.

26. Consequently the Authority has decided to exercise its power in accordance with articles 3(c)(1) and 57 of the Law and article 5.3 of the Access Regulation to issue this Order to Batelco with respect to its RO submitted on 16 October 2014. In order to ensure that tariffs are based on forward-looking costs, the review of Batelco’s 2014 RO submission will not rely exclusively on a single source of costing information. In previous reviews, the Authority based its analysis only on costing information provided by Batelco’s regulatory accounts, completed with benchmark information. In the case of this review, the Authority has utilised costing information provided in Batelco’s 2012, 2013 and 2014 regulatory accounts, benchmark information, in combination with information provided by Bottom-Up (‘BU’) cost models.

27. Other than as detailed in this Order, the Authority has used Top Down (‘TD’) costs as set out in the 2012, 2013 and 2014 Fully Allocated Cost and Long Run Incremental Cost regulatory accounts as well as the outputs of the fixed access network and fixed core network bottom-up cost models or BU costs to set tariffs.

28. The TD costs have been adjusted where appropriate. The regulatory accounts are prepared in accordance with Batelco’s Accounting Procedures Manual (“APM”) approved by the Authority. The APM sets the principles and methods according to which Batelco’s regulatory accounts must be prepared. It provides some details on the accounting treatment of costs and their allocation.

29. In assessing whether charges are fair and reasonable and non-discriminatory, the Authority also considers the relative relationship between the prices of wholesale services and the equivalent retail services. To this end, the Authority has consistently applied the same competition-based analytical framework to analyse wholesale and retail tariffs in order to ensure that there is consistency between the charges applicable at various levels of the value chain. This framework looks at whether retail services can be replicated by OLOs which rely on wholesale regulated products and remain profitable, thereby ensuring that tariffs are compatible with the development of sustainable and effective competition. The objective of introducing wholesale products which give access to bottlenecks controlled by dominant operators is to enable competitors that do not control such bottlenecks to compete at the downstream level. This is a core premise of the wholesale regulation of dominant operators.

30. In setting terms which are fair and reasonable, the Authority must also take into account the principle of non-discrimination referred to in article 57(b) of the Law and article 6 of the Access Regulation.
Q1. Please provide any comments you may have in relation to the Authority’s premise of fair, reasonable and non-discriminatory terms, conditions and tariffs for regulated RO products and services.

SUMMARY OF SUBMISSIONS ON SECTION 1

31. In this subsection, the Authority will add a summary of the submissions and cross-submissions (if any) received from stakeholders on section 1 (Introduction).

THE AUTHORITY’S FINAL CONCLUSIONS ON SECTION 1

32. In this subsection, the Authority will provide its final views and conclusions with regard to section 1 (Introduction).
2 General amendments to the RO

33. In this section, the Authority proposes several general amendments to be made to Batelco’s RO.

**CONSULTATION TEXT**

34. In its previous reviews of Batelco’s RO, the Authority had identified several changes that would enhance the RO terms and conditions. The Authority is of the view that the following changes will enhance the transparency the RO terms and conditions of the fairness and reasonableness of the RO terms and conditions as per Article 57 of the Telecommunications Law.

2.1 Publication of RO changes

35. The Authority considers that Batelco should make available ‘marked-up’ versions of the RO schedule subject to changes, along with ‘unmarked versions of the same RO schedule. Such an approach will enable OLOs to easily and quickly identify all the changes made to the RO schedules without the need to carefully compare amended RO schedules against previous versions.

36. The Authority also considers that the ‘marked-up’ versions of RO schedules should remain available on Batelco website for a minimum of three (3) calendar months.

37. Furthermore, the Authority considers that Batelco should notify OLOs via email of any changes to be made to the RO. This would allow OLOs to be aware of any such changes before they are published on Batelco’s website. On the publication day of RO schedules, Batelco should also notify OLOs via email of such publication.

38. For all the above reasons, the Authority considers that Batelco shall comply with the following:

a. Within 7 calendar days following the date of issuance of this Batelco Order, Batelco shall notify via email all its wholesale customers copying the Authority of the new ordered price terms and the new ordered non-price terms, including their effective implementation date which shall not be later than 60 calendar days following issuance of this Batelco Order.

b. Within 60 calendar days from the date of issuance of this Batelco Order:

i. Batelco shall reflect the ordered price terms and ordered non-price terms in its RO by amending the relevant RO schedules;

ii. Batelco shall, before the effective implementation date, make available on its website ‘marked-up’ and ‘unmarked’ versions of the RO; and

iii. Batelco shall promptly thereafter notify via email all its wholesale customers copying the Authority of the RO publication.
Draft Order on the Reference Offer of Batelco
Annex A – Order Legal Basis and Reasoning

c. Batelco shall ensure that the ‘marked-up’ versions of RO schedules reflecting ordered price terms and ordered non-price terms remain available on its website for a minimum period of three (3) calendar months following the publication of the RO.

2.2 Revision history included in all RO schedules

39. The Authority is concerned that Batelco does not include any information on the history of the different versions of the RO schedules available on Batelco’s website. This information is important for OLOs and the Authority to have an overview of the major changes made to RO schedules.

40. The Authority therefore orders Batelco to:

   a. introduce an additional section at the beginning of each RO schedule called ‘Revision history’. The ‘Revision history’ page should include a table with three columns:
      i. a first column with header “Date” which provides the date of the amendment;
      ii. a second column with header “Amendment” which provides the title of the amendment made to the RO schedule; and
      iii. a third column with header “Description of amendment” which provides a summary description of the amendment made to the RO schedule, its location within the schedule (i.e. page number), and the context that led to such amendment (e.g. RO approval, RO Order, Retail Tariffs Notification etc.)

   b. maintain and update the “Revision history” table included in each RO schedule.

2.3 Improvements to RO Schedule 3

41. The Authority considers that the RO Schedule 3 (CHARGES) should be the only RO schedule that contains price terms. The duplication of RO service charges in the Service Descriptions and the Schedule 3 is confusing and unnecessary and can potentially lead to errors when updates are required. For instance, the Authority has come across cases where the charges included in the Service Description were not updated. Such a situation creates confusion as to which charges were correct. Furthermore, the Authority considers that all references to charges in the service descriptions should be made using a code system, which would facilitate cross-reference to the price list of Schedule 3.

42. Furthermore, the RO Schedule 3 contains for wholesale products and services which are price-regulated, as well as charges for wholesale products and services that are unregulated. To prevent misinterpretation, the Authority considers that a clear distinction should be made between regulated and unregulated charges.

43. Finally, to improve the RO transparency, the Authority considers that any ordered or approved charges should be inserted in RO Schedule 3 without replacing previously ordered or approved charges. For example, this may be done by indicating the period for which the charges apply or used to apply.

44. For all the above reasons, the Authority therefore orders Batelco to amend its RO as follow:
Draft Order on the Reference Offer of Batelco
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a. RO Schedule 3 as the only source of price term information:
   i. Batelco is ordered to remove all pricing elements (i.e. monetary terms) from all RO schedules other than Schedule 3. Batelco is required to maintain all pricing elements only in RO Schedule 3.
   ii. Batelco is ordered to ensure that all pricing elements in Schedule 3 are correctly described and explained (i.e. unit of the charges and applicable limitations, if any).
   iii. Batelco is ordered to ensure that the price implication for each service element in the service descriptions are referenced by a code which allows unambiguous cross-reference to the price list of Schedule 3.

b. Distinction of regulated vs. non-regulated charges in RO Schedule 3: Batelco is ordered to indicate which wholesale products and services in its RO Schedule 3 are price-regulated and which are not, either by virtue of re-organising the RO Schedule 3 in different sections, or by virtue of including a specific mention before the corresponding charges.

c. Historic regulated charges in RO Schedule 3: Batelco is ordered to keep all previously ordered or approved charges in RO Schedule 3 and to indicate the period during which such charges were applicable. For the avoidance of doubt, this requirement is not retro-active.

2.4 Availability of RO forms

45. The Authority considers that all the different forms which Batelco requires OLOs to use in the context of the RO are integral parts of the RO and should therefore be available for download on the RO section of its website. The forms which should be available should at least cover the following activities, if applicable:
   a. Service Request Form i.e. forms for ordering, modifying or cancelling a product or service;
   b. Submission of forecast information;
   c. Report of a fault; and
   d. Claim of an unpaid service rebate.

46. The availability of the above forms in Batelco’s website will improve the transparency of the different RO processes. This also ensures that the communication between OLOs and Batelco is somehow standardised.

47. The Authority therefore orders Batelco to make available on the RO section of its website all RO forms used for RO-related processes.

Q2. Do you agree with the Authority’s proposed general amendments to be made to Batelco’s RO? Please explain your position. If you disagree, please propose an alternative.
SUMMARY OF SUBMISSIONS ON SECTION 2

48. In this subsection, the Authority will add a summary of the submissions and cross-submissions (if any) received from stakeholders on section 2 (General amendments to the RO).

THE AUTHORITY’S FINAL CONCLUSIONS ON SECTION 2

49. In this subsection, the Authority will provide its final views and conclusions with regard to section 2 (General amendments to the RO).
3 Framework for defining Service Levels

50. In the following section, the Authority indicates which regulated wholesale access products are to be subject to Service Levels. The Authority also proposes a framework for such Service Levels.

CONSULTATION TEXT

3.1 RO Schedules to include Service Level Terms and Penalties

51. The Authority considers that Service Levels including Service Level Terms and Service Level Penalties should be integral to the RO Schedules for the services associated with the following wholesale products: 3

   a. Wholesale Local Access ("WLA") and Wholesale Data Connection ("WDC"), which are described in section 5 (see page 52); and
   b. Bitstream, which is described in section 7 (see page 115).

52. The potential range of services associated with the above products that the Authority considers the Service Levels should address includes:

   a. New Connection – provide a new connection as requested by the OLO;
   b. Transfer – transfer an existing connection from one operator to another operator;
   c. Upgrade and Downgrade – upgrade or downgrade the speed of an existing connection;
   d. Hot and Cold Migration – change the end user address of an existing connection, requiring disconnection and reconnection of the connection end point, including “hot migration” which is when the connection is not disrupted and “cold migration” which is when the connection can be disrupted;
   e. Reconfiguration – reconfigure technical parameters of an existing connection, such as adding a VLAN; and
   f. Cancellation – OLO requests the relinquishment of an existing connection.

53. The above list of services is indicative of the range services that are to be covered by the Service Level Terms and Penalties. The final list may include other services, and the list may differ between (a) the WLA and WDC products and (b) the Bitstream product. The Authority expects that the complete list of services will be specified in the service description of each product.

3 While Batelco use the term “service” in its RO to refer to regulated remedies (e.g. Bitstream service), the Authority considers that instead, it is more appropriate to use the term “product” (i.e. Bitstream product) where “services” should be used for activities associated with such product (see also paragraph 52).
54. Notwithstanding any differences between the services associated with the products, the Authority considers that framework for defining Service Levels should apply to these services and any others. However, the Authority considers that the specific terms and penalties for these Service Levels are likely to differ between these services and products. These Service Levels in relation to the products (i.e. Wholesale Local Access/Wholesale Data Connection and Bitstream) are set out in sections 5 and 7 of this annex.

55. The Service Levels to be included in the RO will require Batelco to supply the relevant wholesale products in accordance with specified terms. Failure to meet certain Service Level Terms will entitle the concerned wholesale customer to receive a level of monetary compensation defined by the Service Level Penalties.

Rationale of ordering the addition of Service Levels to the RO

56. The reasons for revising the Service Levels applicable to the WLA product and the reasons for introducing Service Levels for WDC and Bitstream products are all developed, in detail, in the Domestic Data Connectivity Market Review and the Broadband Market Review, respectively. For convenience, the relevant sections for these market reviews have been included in Annex B of this document.

57. In summary, these reviews concluded that prescribed Services Levels are required to promote sustainable and effective competition in the relevant downstream, retail markets. In particular, the purpose of specifying the Service Level terms and penalties are to:

   a. provide the Service Levels that Batelco is expected to maintain in the supply of the relevant regulated wholesale products; and

   b. provide Batelco with an economic incentive to maintain these Service Levels.

58. The Authority has introduced Service Levels in RO Orders in the past. Service Level Terms and Penalties have been introduced in the Local Loop Unbundling Order of 2011 (‘LLU Order’) and for the WLA. These are examples where the Authority has required Batelco to introduce Service Level Terms for certain regulated wholesale products, and they highlight a reason for incorporating Service Levels in the RO Order is the absence of Batelco voluntarily providing such Service Levels.

59. The Authority considers that the service descriptions of the relevant regulated wholesale products currently do not provide Batelco with the incentive to deliver these products promptly, efficiently, and at an acceptable level of quality. There are therefore limited safeguards in the RO to mitigate Batelco’s ability to:

   a. discriminate between an OLO’s and Batelco’s retail business unit, when provisioning regulated wholesale products, which are in competition in downstream retail markets; and

   b. restrict competition by supplying poor quality wholesale products to OLOs.

---

4 Local Loop Unbundling Reference Offer Order issued on 5 May 2011 (ref: MCD/05/11/055).
5 The WLA was launched by Batelco on 27 November 2012.
60. In addition to introducing Service Levels for WLA, WDC and Bitstream, the Authority also considered whether to introduce Service Levels for Business Wholesale DSL (“WDSL”). The Authority has decided, however, not to do so because Business WDSL is in the decline phase of its product life cycle. The volume of the Business WDSL subscriptions has been declining over the last 2-3 years as wholesale customers switch to Bitstream. This decline of Business WDSL raises the risk that ordering the introduction of Service Levels would have the following consequences:

a. The regulatory cost of imposing Service Levels on Business WDSL may be greater than any market benefits, which implies that the introduction of Service Levels in this case may not promote an efficient market outcome. This follows from the fact that the decline in Business WDSL would limit the time horizon over which the cost of introducing Service Levels could be recovered. This ultimately would be disproportionate.

b. Should regulated Service Levels be imposed on Business WDSL then these would need to be carefully calibrated with respect to the Service Levels for Bitstream, as these products are substitutes and OLOs are transitioning from Business WDSL to Bitstream. Regulating both sets of Service Levels may either speed-up or slow-down the rate of transition compared with the rate of transition that may be efficient. The Authority therefore considers that the risk of such an unintended, detrimental consequence is best managed by introducing Service Levels for Bitstream and not for Business WDSL. That is, Bitstream would become the anchor product, whereby regulating the Service Levels of Bitstream would indirectly influence Batelco’s incentive to maintain the quality of service for Business WDSL, while allowing Batelco a degree of flexibility to determine an appropriate terms of the Service Levels. If the quality of service for Business WDSL is not satisfactory, then OLOs have the option to migrate from the Business WDSL product to the Bitstream product.

61. In addition, however, to exercising forbearance in relation to introducing Services Levels for Business WDSL, the Authority will closely review the QoS reports submitted by Batelco under the QoS Regulation obligations. If required by the evidence, the Authority will investigate the effect of any differences in quality indicator measurements between Batelco’s retail DSL services and the WDSL services on competition.

62. Finally, for the avoidance of doubt, the Authority wishes to clarify that the introduction of Service Level Terms and Service Level Penalties should not be construed as a limitation of the Authority’s right to take remedial action in accordance with the provisions of the Law in the event of a material breach by Batelco of the Law or its licenses.

Q3. Do you agree with the Authority’s proposal to mandate the introduction of Service Levels for the Wholesale Data Connection and the Bitstream products and services? Please explain and justify your position.
3.2 Service Level framework

In this section, the Authority sets out the overarching framework for the Service Level Terms and Service Level Penalties as applied to Bitstream and Wholesale Data Connection. The framework comprises high-level descriptions of the operational processes associated with product delivery, maintaining service quality, as well as fault management and restoration. These descriptions are used to identify the key parameters that are to be regulated by the Service Levels Terms and Service Level Penalties. The parameter values are then populated in sections 5 and 7 of this annex for Wholesale Data Connection and Bitstream, respectively.

The Authority understands that these descriptions provided here may need to be amended to accommodate the specificities of a given regulated access product. In such circumstance, stakeholders should propose such amendments with supporting evidence. Specifically, these processes are:

a. service request process;
b. service delivery process;
c. service quality management process; and
   d. fault management process.

Each of these process are considered in turn in the following subsections.

3.2.1 Service request process

The service request process consists of two Service Levels, which are:

a. Service Request Acknowledgement; and
b. Service Request Confirmation.

Both Service Levels are described and defined in the following table with the associated deliverables, actual measures of performance, Service Level Terms and Service Level Penalties.

Figure 3: Service Levels for the service request process (defined terms are capitalized and italicized)

<table>
<thead>
<tr>
<th>Deliverable</th>
<th>Service Request Acknowledgement</th>
<th>Service Request Confirmation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The OLO receives a notice from Batelco acknowledging receipt of the OLO’s Service Request.</td>
<td>The OLO receives a notice from Batelco informing that Batelco either accepts a Service Request or rejects it because insufficient or incorrect information is provided by the OLO in the Service Request Form. Absent any notice within the Maximum Time for Service Request Confirmation, the Service Request is deemed to have been accepted by Batelco.</td>
</tr>
</tbody>
</table>
### Service Level

#### Service Request Acknowledgement

Actual Time for Service Request Acknowledgement means the time period between the following events:

- a. the OLO sends a Service Request to Batelco, and
- b. the OLO receives a notice from Batelco acknowledging that the Service Request has been received.

Maximum Time for Service Request Acknowledgement means the maximum Actual Time for Service Request Acknowledgement that Batelco should meet at all times.

#### Penalties for Service Request Acknowledgement

The Authority does not presently propose to define any penalties for failure to meet the Maximum Time for Service Request Acknowledgement.

When the OLO does not get an acknowledgment notice from Batelco within the Maximum Time for Service Request Acknowledgement, the OLO should follow up/escalate its request directly with its Batelco wholesale account manager.

#### Service Request Confirmation

Actual Time for Service Request Confirmation means the time period between the following events:

- a. the OLO receives a notice from Batelco acknowledging that the Service Request has been received; and
- b. one of the following three events, whichever happens the soonest:
  - i. the OLO receives a notice from Batelco indicating that the information provided by the OLO in the Service Request Form is incorrect and/or insufficient to progress the Service Request to the service delivery process; or
  - ii. Accepted Service Request (explicit acceptance from Batelco) which happens when the OLO receives a notice from Batelco confirming that the information provided by the OLO in the Service Request Form is correct and sufficient to progress the Service Request to the service delivery process; or
  - iii. Accepted Service Request (deemed acceptance from Batelco) which happens at the end of the Maximum Time for Service Request Confirmation, where absent formal notice from Batelco, the Service Request is deemed to have been accepted by Batelco and thus progressed to the service delivery process.

Maximum Time for Service Request Confirmation means the maximum Actual Time for Service Request Confirmation after which, absent formal notice from Batelco, the Service Request is deemed to have been accepted by Batelco.

Penalties for Service Request Confirmation

The Authority does not presently propose to define any penalties for Service Request Confirmation.

Source: the Authority

68. The following diagrams illustrates the relationship between the two Service Levels set out in the above table, with the Service Level Terms and deliverables along the service request process. Two scenarios are represented:
a. scenario A1: the Service Request is explicitly accepted (or rejected) by Batelco and;
b. scenario A2: the Service Request is deemed to have been accepted by Batelco.

Figure 4: The Authority’s illustration of the service request process

**Scenario A1 (service request process)**

![Scenario A1 Diagram]

**Scenario A2 (service request process)**

![Scenario A2 Diagram]

Source: the Authority

69. The above diagram show that the service request process starts from the time when an OLO sends a Service Request Form to Batelco and it ends at one of the following event, whichever happens the soonest:

a. the OLO receives confirmation from Batelco that the Service Request is either accepted or rejected by Batelco in accordance with the specific requirements set by the RO, if any; or

b. the end of the Maximum Time for Service Request Confirmation.

70. The service request process described above follows the below principles:
a. All Service Requests should be made by OLOs using the Service Request Form provided in the annex of the service description.

b. The actual time within which the OLO receives a Service Request Acknowledgement from Batelco (i.e. Actual Time for Service Request Acknowledgement) starts when the OLO sends Batelco a Service Request in accordance with processes set out in the RO. The OLO is then to receive an acknowledgement notice within the Maximum Time for Service Request Acknowledgement, as described in the above diagrams.

c. Absent receipt of an acknowledgement notice from Batelco within the Maximum Time for Service Request Acknowledgement, the OLO should follow up its Service Request directly with its Batelco wholesale account manager. This escalation process should be documented in the RO.

d. Following the OLO’s receipt of the Service Request Acknowledgment notice, the OLO is to then receive from Batelco confirmation that the information provided by OLO in the Service Request Form is correct and sufficient to progress the Service Request to the service delivery process (i.e. "Accepted Service Request"). See scenario A1 (first diagram above).

e. At the contrary, if the information contained in the Service Request Form is insufficient or incorrect to progress the Service Request to the service delivery process, then Batelco notifies the OLO that the Service Request is rejected and provides in such notice, the reasons for the rejection. The exhaustive list of potential reasons for which Batelco may reject a Service Request should be documented in the relevant RO schedule. See Scenario A1 (first diagram above).

f. If the OLO does not receive a confirmation from Batelco within the Maximum Time for Service Request Confirmation, then the Service Request is deemed to have been accepted by Batelco. See scenario A2 (second diagram above).

g. If a Service Request is rejected more than twice, then Batelco is to assist the OLO to complete a valid Service Request Form.

Q4. Do you agree with the Authority’s proposed definition and description of the service request process? Please explain and justify your position.

3.2.2 Service delivery process

71. The service delivery process consists of two Service Levels, which are:
   a. Notification of Expected RFT and RFS Dates; and
   b. Service Level for RFS Date.

72. Both Service Levels are described in the following table with the with the associated deliverables, actual measures of performance, Service Level Terms and Service Level Penalties.
### Service Levels defined for the service delivery process (defined terms are capitalized and italicized)

<table>
<thead>
<tr>
<th>Service Level</th>
<th>Notification of Expected RFT and RFS Dates</th>
<th>Service Level for RFS Date</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Deliverable</strong></td>
<td>OLO receives a notice from Batelco of the dates that Batelco expects the connection to be Ready For Test (&quot;RFT&quot;) and then Ready For Service (&quot;RFS&quot;). In such notice, Batelco also indicates the <strong>Maximum RFS Date</strong>, the <strong>Maximum Delivery Time</strong> and the <strong>Maximum Delivery Date</strong>. The <strong>Maximum RFS Date</strong> must be set no later than the <strong>Maximum Delivery Date</strong>.</td>
<td>OLO receives a <strong>RFS Certificate</strong> from Batelco confirming that: a. the connection has been provisioned and tested by Batelco; b. the connection is properly registered in all of Batelco’s systems (e.g. OSS/BSS, service level monitoring platform, fault reporting system etc.); c. the connection has been validated by the OLO (or deemed to have been validated by the OLO if the Maximum Validation Time has lapsed); and d. the connection is ready for service and the OLO will be invoiced accordingly.</td>
</tr>
<tr>
<td><strong>Actual measure of performance</strong></td>
<td><strong>Actual Time for Notification of Expected RFT and RFS Dates</strong> means the time period between the following events: a. Accepted Service Request, and b. the OLO receives a notice from Batelco indicating the <strong>Expected RFT Date</strong>, the <strong>Expected RFS Date</strong>; the <strong>Maximum Delivery Time</strong>; and the <strong>Maximum Delivery Date</strong>.</td>
<td><strong>Actual Delivery Time</strong> means the time period between the following events: a. <strong>Accepted Service Request</strong>, and b. <strong>Actual RFS Date</strong> which happens when the OLO receives the <strong>RFS Certificate</strong> from Batelco. Batelco may only issue the <strong>RFS Certificate</strong> to the OLO after one of the following events, whichever happens the soonest: a. the OLO sends a notice to Batelco confirming that the connection has been correctly provisioned and can be considered RFS; or b. the end of the <strong>Maximum Validation Time</strong> i.e. the OLO has not explicitly raised any issue and the <strong>Maximum Validation Time</strong> lapsed.</td>
</tr>
<tr>
<td></td>
<td><strong>Maximum Validation Time</strong> means the maximum <strong>Actual Validation Time</strong> after which, absent formal notice from the OLO, Batelco may issue the <strong>RFS Certificate</strong>. <strong>Actual Validation Time</strong> means the time period(s) between the following events: a. <strong>Actual RFT Date</strong> which happens when the OLO receives a notice from Batelco confirming that the connection has been provisioned the same day and is ready for test; and b. one of the following two events, whichever happens the soonest: i. the OLO sends a notice to Batelco confirming that the connection is performing in accordance with the Acceptance Criteria; ii. the end of the <strong>Maximum Validation Time</strong></td>
<td></td>
</tr>
</tbody>
</table>
The Actual Validation Time is suspended between the following events, if such events occur:

a. the OLO sends a notice to Batelco indicating that the connection is not performing in accordance with the Acceptance Criteria; and
b. the OLO receives a notice from Batelco indicating that the connection has been re-provisioned.

### Service Level Terms

**Maximum Time for Notification of Expected RFT and RFS Dates**

- means the maximum Actual Time for Notification of Expected RFT and RFS Dates after which Batelco is subject to Penalties for Notification of Expected RFT and RFS Dates.

**Maximum RFS Date**

- means the last day on which the OLO should receive the RFS Certificate for Batelco not to be subject to Penalties for RFS Date.

- Actual RFS Date ≤ Maximum RFS Date.

- The Maximum RFS Date corresponds to the Expected RFS Date, if the latter has never been modified after the notice of Expected RFT and RFS Dates

- If the Actual RFS Date happens after the Expected RFS Date, Batelco shall be subject to Penalties for RFS Date.

### Service Level Penalties

**Penalties for Notification of Expected RFT and RFS Dates**

- means the penalties due by Batelco for not meeting the Maximum Time for Notification of Expected RFT and RFS Dates as specified in the relevant RO service description.

**Penalties for RFS Date**

- means the penalties due by Batelco for not meeting the Maximum RFS Date as specified in the relevant RO service description.

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73. The following diagrams illustrate the relationship between the two Service Levels set out in the above table, with the Service Level Terms and deliverables along the service delivery process. Four scenarios are represented:

a. scenario B1 is the base scenario where the Expected RFT Date is met, and the Actual RFS Date happens before the Maximum RFS Date;

b. scenario B2 is a variant of scenario B1. The Actual RFS Date happens on the Expected RFS Date as the RFS Certificate is issued at the end of the Maximum Validation Time;

c. scenario B3 where the Expected RFT Date is shifted and the Actual RFS Date happens after the Maximum RFS Date; and

d. scenario B4: where the Expected RFT Date is met, but the OLO notifies Batelco that the connection is not performing in accordance with the Acceptance Criteria. Batelco re-provisioned the connection. The Actual RFS Date happens after the Maximum RFS Date.
Figure 6: The Authority’s illustration of the service delivery process

Scenario B1 (service delivery process)

1. The RFT Date is met by Batelco (i.e. Actual RFT Date = Expected RFT Date).
2. Before the end of the Maximum Validation Time, the OLO sends Batelco a notice confirming that the connection has been properly provisioned (i.e. performing in accordance with the Acceptance Criteria).
3. The OLO receives the RFS Certificate from Batelco. The Service Request is completed before the Maximum RFS Date.

Scenario B2 (service delivery process)

1. The RFT Date is met by Batelco (i.e. Actual RFT Date = Expected RFT Date).
2. The OLO does not send Batelco any notice during the Maximum Validation Time.
3. The OLO receives the RFS Certificate from Batelco on the Expected RFS Date. The Service Request is completed on the Maximum RFS Date.
Scenario B3 (service delivery process)

1. The Expected RFT Date (initial) is not met by Batelco. A new revised Expected RFT Date is set at a later stage. The Expected RFS Date is shifted accordingly. However, the Maximum RFS Date remains the same.
2. The OLO does not send Batelco any notice during the Maximum Validation Time.
3. The OLO receives the RFS Certificate from Batelco at the end of Maximum Validation Time. The Service Request is completed after the Maximum RFS Date.

Scenario B4 (service delivery process)

1. The RFT Date is met by Batelco (i.e. Actual RFT Date = Expected RFT Date).
2. The OLO sends Batelco a notice indicating that the connection is not performing in accordance with the Acceptance Criteria. The clock for Maximum Validation Time starts again.
3. The OLO receives a notice from Batelco indicating that the connection has been re-provisioned. The clock for Maximum Validation Time stops.
4. The OLO does not send Batelco any notice during the rest of the Maximum Validation Time.
5. The OLO receives the RFS certificate from Batelco at the end of Maximum Validation Time. The Service Request is completed after the Expected RFS Date.

Source: the Authority
74. The above diagrams shows that the service delivery process starts when a Service Request is accepted by Batelco (either explicitly accepted by Batelco, or deemed to have been accepted by Batelco).

75. The process ends at the Actual RFS Date when the OLO receives the RFS Certificate from Batelco confirming that the product is RFS and that Batelco will bill for the service provided.

76. The service delivery process follows the below principles.

**Before the notice of Expected RFT and RFS Dates**

77. The OLO is to receive a notice from Batelco of:
   a. the date of Accepted Service Request;
   b. the Expected RFT Date;
   c. the Maximum RFS Date / Expected RFS Date ;
   d. the Maximum Delivery Time; and
   e. the Maximum Delivery Date.

78. This notice must be provided in order to coordinate the service delivery between the OLO and Batelco, and to allow the OLO to inform its retail customer of the expected delivery date.

79. The OLO is to receive the notice from Batelco of the Expected RFT Date and Expected RFS Date within a maximum allowed time (i.e. Maximum Time for Notification of Expected RFT and RFS Dates) as set in the relevant RO schedule. As the above diagrams indicates, this maximum time starts when a Service Request is accepted (or deemed to have been accepted).

80. The Maximum Delivery Date is determined by adding the Maximum Delivery Time to the date of Accepted Service Request. The Maximum Delivery Time is to be specified in the relevant RO service description.

81. The Maximum RFS Date must be set no later than the Maximum Delivery Date. At this stage, the Expected RFS Date is set equal to the Maximum RFS Date. 

   $\Rightarrow$ Expected RFS Date = Maximum RFS Date ≤ Maximum Delivery Time.

82. The Expected RFT Date must precede the Expected RFS Date by a period of time equal to the Maximum Validation Time which is to be specified in the relevant RO service description.

83. If the completion of the Service Request requires that Batelco sends a technician at the end-user site, Batelco should provide a 4-hour time window during which the on-site installation is expected to take place on the Expected RFT Date.

84. In the process of setting the Expected RFT Dates for Service Request, Batelco is required to follow a “first come, first served” policy. While Batelco shall not be permitted to discriminate among service requests (and more especially between retail and wholesale service requests), the Authority understands that it maybe optimum from an operational standpoint for Batelco to classify service requests according to the type of work required and manage different queues accordingly.
85. If the OLO has preference for the installation date in the submitted Service Request Form, Batelco should take such preference into consideration when setting the Expected RFT Date provided that this not done at the expense of any other Service Requests.

86. If Batelco fails to meet the Maximum Time for Notification of Expected RFT and RFS Dates, then Batelco will incur Penalties for Notification of Expected RFT and RFS Dates in accordance with the relevant RO schedule for the particular service and product.

87. In all diagrams above (scenarios B1 to B4), Batelco meets the Maximum Time for Notification of Expected RFT and RFS Dates.

**After the notice of Expected RFT and RFS Dates – Coordinating the Expected RFT Date.**

88. The Authority considers that the OLO should handle all communications with the end-user for which the connection is requested. Unless explicitly agreed by the OLO, Batelco should not contact the end-user directly.

89. If a Batelco technician must be present at the end-user site to install a connection, and if, for any reason, the OLO and/or end-user cannot be available on the Expected RFT Date for such installation, the OLO must give Batelco a minimum written notice of two (2) working days. The new dates for RFT and RFS are then set following the below principles:

   a. Batelco should propose the next earliest dates for which a Batelco technician would be available for the installation. The earliest proposed date(s) may exceed the Maximum Delivery Date if Batelco has no other availability until such date.

   b. The OLO is to choose one of the proposed dates which becomes the applicable Expected RFT Date.

   c. The Expected RFS Date is also modified and is set apart from the Expected RFT Date by the Maximum Validation Time (see paragraph 82 above). The Maximum RFS Date is then set equal to the Expected RFS Date.

   d. Batelco is required to send the OLO a notice of the applicable Expected RFT Date, Expected RFS Date, and Maximum RFS Date.

90. If at least one of the following two conditions is met (i) the OLO does not provide Batelco a minimum written notice of two working days to inform of its unavailability; or (ii) Batelco sends a technician who is not able to access the end-user site to install the service, then the OLO is liable to pay the installation and configuration charge for the requested service as specified in the relevant RO service description. In such case, the modification and notification of the Expected RFT Date, the Expected RFS Date, and the Maximum RFS Date follow the same principles as described in the above paragraph 89. For the avoidance of doubt, the OLO will, in this case, be liable to pay two (2) installation and configuration charges when the RFS Certificate is issued by Batelco.

91. Batelco may also contact the OLO to propose to install a connection at an earlier date than the Expected RFT Date. If the OLO provides written consent for an installation at an earlier date, then the Expected RFT Date and Expected RFS Date are revised accordingly. The Maximum RFS Date remains the same. Batelco is required to send the OLO a notice of the applicable Expected RFT Date, Expected RFS Date, and Maximum RFS Date. For the avoidance of doubt, Batelco is not authorised to send a technician at the end-user
premises to install a connection prior to the *Expected RFT Date* unless a written consent is provided by the OLO.

92. If Batelco is not in a position to meet the *Expected RFT Date*, then it should contact the OLO as early as possible and should propose the next earliest dates for which a Batelco technician would be available for the installation. Two cases may be envisaged:

   a. case 1: the OLO is available on the earliest date of Batelco’ proposed dates; or
   b. case 2: the OLO is available on an other date than the earliest date (e.g. second, third, or fourth date or any date thereafter etc.).

93. In case 1, Batelco sets the earliest of the proposed dates as the revised *Expected RFT Date*. The *Expected RFS Date* is also modified is set apart from the *Expected RFT Date* by the *Maximum Validation Time* (see paragraph 82 above). While the *Maximum RFS Date* is unlikely to be met in this case, it remains the same for the purpose of calculating the applicable *Penalties for RFS Date*. Batelco is required to send the OLO a notice of the applicable *Expected RFT Date*, *Expected RFS Date*, and *Maximum RFS Date*. Case 1 is illustrated by scenario B3 (see third diagram above).

94. In case 2, Batelco sets the new revised *Expected RFT Date* to take into account the OLO’s earliest availability (e.g. this date can be the second, third, or fourth date of Batelco’s proposed dates, or any date thereafter). The *Expected RFS Date* is also modified is set apart from the *Expected RFT Date* by the *Maximum Validation Time* (see paragraph 82 above). In case 2, the *Maximum RFS Date* is modified for the purpose of calculating the applicable *Penalties for RFS Date* (i.e. Batelco should only be penalised on the basis of its first availability). The *Maximum RFS Date* is to be shifted by the number of working days that separates the following two dates: (a) the earliest date of Batelco’s availability; and (b) the revised *Expected RFT Date*. Once defined, Batelco is required to send the OLO a notice of the applicable *Expected RFT Date*, *Expected RFS Date*, and *Maximum RFS Date*.

The following is a numerical example illustrating how the *Maximum RFS Date* should be shifted in case 2. Let’s assume that Batelco cannot meet the *Expected RFT Date* that was planned for the 6th working day of a given month. Batelco however indicates to the OLO that it can install the connection on the 9th, 11th, 12th, or 14th working day instead. If the OLO choses the 14th working day of the month, then the *Expected RFT Date and Expected RFS Date* are shifted forward by 8 working days (i.e. 8 = 14 – 6) and the *Maximum RFS Date* is shifted forward by 5 working days (i.e. 5 = 14 – 9).

### Actual RFT Date and Maximum Validation Time

95. When Batelco has provisioned the connection, it should send the OLO a notice confirming that the connection has been provisioned and is ready for test. The OLO’s receipt of Batelco’s notice marks the *Actual RFT Date*. The RFT notice can be directly handed over by Batelco to the OLO if both parties are on site for the installation of the connection.

96. In case the connection was tested by Batelco against the *Acceptance Criteria*, Batelco may also be required to provide the OLO with a copy of test results together with the RFT notice.
97. As part of the RFT notice, Batelco should indicate the *Expected RFS Date* which marks the end date for the *Maximum Validation Time*, after which, absent any issue reported by the OLO, Batelco may issue the *RFS Certificate* to the OLO.

98. The *Actual Validation Time* starts upon receipt by the OLO of the RFT notice. It provides the OLO with an opportunity to check that Batelco has correctly provisioned the connection, and that the connection is performing in accordance with the *Acceptance Criteria* defined in the relevant RO service description. The concept of “Validation Time” is also introduced to provide Batelco a chance to adjust the provisioning of a connection in the first few days following its activation. During this initial period of time, the occurrence of faults tends to be statistically higher and absent the concept of “Validation Time”, Batelco would be subject to heavier penalties such as those defined in the fault management process (see *Penalties for Restoration Time* in section 3.2.4 below). The Authority considers that, during the first few days following activation, Batelco should be subject to lighter penalties such as those defined by the *Penalties for RFS Date*.

99. The *Actual Validation Time* ends at one of the following events, whichever happens the soonest:
   a. the OLO sends Batelco a notice confirming that the connection is performing in accordance with the *Acceptance Criteria*;\(^6\) or
   b. the end of the *Maximum Validation Time*.\(^7\)

100. If during the *Actual Validation Time*, the OLO sends a notice to Batelco to indicate that the connection is not performing in accordance with the *Acceptance Criteria*, the clock for *Actual/Maximum Validation Time* stops.\(^8\)

101. The clock for *Actual/Maximum Validation Time* starts back ticking when the OLO receives a notice from Batelco indicating that the connection has been re-provisioned. In such notice, Batelco is required to provide the revised *Expected RFS Date* which marks the end of the *Maximum Validation Time*. During the re-provisioning of the connection, Batelco should regularly update the OLO on the progress made towards the re-provisioning of the connection.

102. The OLO is to receive a *RFS Certificate* from Batelco if one the following condition is met:
   a. the OLO has sent Batelco a notice confirming that the connection is performing in accordance with the *Acceptance Criteria* (i.e. correctly provisioned); or
   b. the *Maximum Validation Time* has lapsed and the provisioning of the connection is deemed to have been validated by the OLO.

103. The *RFS Certificate* is to confirm that:

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\(^6\) Scenario B1 (see above diagrams) provides an illustration of the case wherein the OLO confirms to Batelco that the connection is performing in accordance with the *Acceptance Criteria* (i.e. the connection has been correctly provisioned).

\(^7\) Scenarios B2, B3 and B4 (see above diagrams) are cases wherein Batelco issues the *RFS Certificate* at the end of the *Maximum Validation Time*.

\(^8\) This case is illustrated by scenario B4 (see above diagrams).
a. the connection has been provisioned and tested by Batelco;

b. the connection is properly registered in all of Batelco’s systems (e.g. OSS/BSS, service level monitoring platform, fault reporting system etc.);

c. the connection has been validated by the OLO (or deemed to have been validated by the OLO if the Maximum Validation Time has lapsed); and

d. the connection is ready for service and the OLO will be invoiced accordingly.

104. The date of the OLO’s receipt of the RFS Certificate is the Actual RFS Date which marks the end of the Actual Delivery Time. The Service Request is now considered completed. Batelco can send the OLO the invoice for installation, configuration and activation charges, if any (i.e. Non-Recurring Charges (“NRC”)). The connection (or amended connection) is billed from the Actual RFS Date (i.e. Monthly Recurring Charges (“MRC”)).

105. The Maximum RFS Date requires that the Actual RFS Date happens before or after the Expected RFS Date. If the Actual RFS Date happens after the Expected RFS Date, Batelco shall be subject to Penalties for RFS Date as defined in the relevant RO service description. In the above diagrams, scenarios B3 and B4 provide examples of cases where Batelco does not meet the Expected RFS Date and is thus subject to Penalties for RFS Date.

**Cancellation of a Service Request during the service delivery process**

106. The Authority considers that the following provisions shall apply when an OLO cancels a Service Request during the service delivery process:

a. If the OLO’s request to cancel a Service Request occurs up to two working days after the notice of Expected RFT and RFS Dates, then the OLO shall not be penalized;

b. Subject to paragraphs (c) and (d) below, if the OLO’s request to cancel a Service Request occurs three or more working days after the notice of Expected RFT and RFS Dates, the OLO shall be liable to pay one (1) Monthly Recurring Charge to Batelco;

c. If two (2) calendar months following the Maximum RFS Date, Batelco has not yet issued the RFS Certificate for the requested service and the OLO sends a request to cancel the Service Request, then Batelco shall be liable to pay the OLO penalties equal to three (3) Monthly Recurring Charges.

d. If Batelco issues the RFS Certificate on a date which exceeds by more than two (2) calendar months the Maximum RFS Date, then the Penalties for RFS Date shall be capped at five (5) Monthly Recurring Charges (i.e. 500 SCs).

**Q5.** Do you agree with the Authority’s proposed definition and description of the service delivery process? Do you agree with the proposed provisions that the Authority considers should apply in case an OLO cancels a Service Request during the delivery process? Please explain and justify your position.
3.2.3 Service quality management process

107. Service quality management process is an on-going process which corresponds to the day-to-day management of service quality with a view to ensuring that the connection perform in accordance with the Quality of Service ("QoS") Parameters defined in the service description (or in accordance with international standards if no specific QoS Parameters are defined).

108. The QoS Parameters are a set of technical parameters which a connection must meet to be considered as available. When the connection is performing below the QoS Parameters, it is considered unavailable and the OLO may report a fault to Batelco in accordance with the fault management process.

3.2.4 Fault management process

109. The fault management process consists of three Service Levels, which are:
   a. Fault Acknowledgement Time;
   b. Response Time; and
   c. Restoration Time.

110. All three Service Levels are described in the following table with the associated deliverables, actual measures of performance, Service Level Terms and Service Level Penalties.
Figure 7: Service Levels defined for the service delivery process (defined terms are capitalized and italicized)

<table>
<thead>
<tr>
<th>Service Level Terms</th>
<th>Fault Acknowledgment Time</th>
<th>Response Time</th>
<th>Restoration Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deliverable</td>
<td>The OLO receives a trouble ticket after having reported a fault to Batelco.</td>
<td>The OLO receives a notice confirming that Batelco has started troubleshooting the fault (either remotely or on site).</td>
<td>The OLO receives a notice from Batelco indicating the connection has been restored and the trouble ticket closed.</td>
</tr>
<tr>
<td>Actual measure of performance</td>
<td>Actual Fault Acknowledgment Time means the time period between the following events: a. the OLO reports a fault to Batelco, and b. the OLO receives a trouble ticket from Batelco for the reported fault.</td>
<td>Actual Response Time means the time period between the following events: a. the OLO reports a fault to Batelco, and b. the OLO receives a notice from Batelco confirming that the troubleshooting of the fault has started (either remotely or on site). Once a Batelco technician has started troubleshooting the fault, Batelco is required to regularly update the OLO of the progress made to restore the connection, and to provide an indication of the anticipated restoration time.</td>
<td>Actual Restoration Time means the time period between the following events: a. the OLO reports a fault to Batelco, and b. the OLO receives a notice from Batelco indicating the connection has been restored and the trouble ticket closed. Batelco is allowed to close a trouble ticket only if one of the following conditions is met. a. Batelco provides a proof (i.e. test results) that the connection is performing in accordance with the QoS Parameters; or b. Batelco has received a confirmation from the OLO that the service is performing in accordance with the QoS Parameters.</td>
</tr>
</tbody>
</table>

Service Level Penalties

<table>
<thead>
<tr>
<th>Penalties for Fault Acknowledgment Time</th>
<th>The Authority does not presently propose to define any penalties for failure to meet the Maximum Fault Acknowledgment Time.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Penalties for Response Time</td>
<td>The Authority does not presently propose to define any penalties for failure to meet the Maximum Response Time.</td>
</tr>
<tr>
<td>Penalties for Restoration Time</td>
<td>The penalties due by Batelco for not meeting the Maximum Restoration Time as specified in the relevant RO service description.</td>
</tr>
</tbody>
</table>

Source: the Authority
111. The following diagram illustrates the relationship between the three Service Levels set out in the above table, with the Service Level Terms and deliverables along the fault management process.

**Figure 8: The Authority's illustration of the fault management process**

112. The above diagram shows that the faults management process starts when an OLO reports a fault to Batelco. It ends when the OLO receives a notice from Batelco confirming that the service has been restored. The fault management process described above follows the below principles:

a. Within the Maximum Fault Acknowledgement Time, the OLO is to receive a notice (i.e. open trouble ticket) from Batelco that acknowledges that its fault report has been received. The Actual Fault Acknowledgement Time starts when the OLO reports a fault to Batelco and ends when the OLO receives the open trouble ticket. If the OLO does not receive an acknowledgment receipt within the Maximum Fault Acknowledgement Time, then it should escalate the fault report to its Batelco account manager.

b. Within the Maximum Response Time, the OLO is to receive a notice from Batelco confirming that a Batelco technician has started troubleshooting the fault either remotely (from Batelco’s network operation centre) or dispatched on-site. The Actual Response Time starts when the OLO reports a fault to Batelco and ends when the OLO receives a notice confirming that the troubleshooting of the fault has started.
c. Once a Batelco technician has started troubleshooting the fault, Batelco is required to provide an update of the progress made to restore the connection. Such update should be provided as soon as possible and should include an estimate of the anticipated restoration time. Batelco should continue to update the OLO on regular basis thereafter.

d. Within the *Maximum Restoration Time*, the OLO is to receive a notice from Batelco confirming that the connection has been restored and the trouble ticket closed. The *Actual Restoration Time* starts when the OLO reports a fault to Batelco and ends when the OLO receives the notice from Batelco confirming that the connection has been restored.

e. Batelco is authorised to close a trouble ticket if one of the following two conditions is met:
   i. Batelco provides the OLO with a proof (i.e. test results) that the connection is performing in accordance with the QoS Parameters; or
   ii. Batelco has received a confirmation from the OLO that the service is performing in accordance with the QoS Parameters.

f. If the *Actual Restoration Time* exceeds the *Maximum Restoration Time*, then Batelco shall be subject to *Penalties for Restoration Time* as defined in the relevant RO service description.

g. If after investigation, Batelco can demonstrate that the service was affected by a fault falling within the scope of the OLO’s responsibility and reasonable control (or within the scope of the end user’s responsibility and reasonable control), then Batelco is allowed to charge the OLO a reasonable NRC to recover the costs incurred in investigating/troubleshooting the fault and Batelco shall not be liable to the payment of *Penalties for Restoration Time*.

Q6. Do you agree with the Authority’s proposed definition and description of the fault management process? Please explain your position.

3.2.5 Payment of Service Level Penalties

113. Three different Service Level Penalties are defined in the above proposed framework:
   a. Penalties for Notification of Expected RFT and RFS Dates;
   b. Penalties for RFS Date; and
   c. Penalties for Restoration Time

114. Service Level Penalties shall be due by Batelco any time Batelco fails to meet any of the following Service Level Terms for reasons attributable to Batelco:
   a. the Maximum Time for Notification of Expected RFT and RFS Dates;
   b. the Maximum RFS Date;
Draft Order on the Reference Offer of Batelco
Annex A – Order Legal Basis and Reasoning

115. Service Level Penalties shall be expressed in Service Credits. A Service Credit (“SC”) is defined as one per cent (1%) of the applicable monthly recurring charge for the connection.9

116. Service Level Penalties shall be directly reflected in the next monthly invoice(s) in the form of rebate(s). The Authority is of the view that Service Level Penalties shall not have to be claimed by OLOs for Batelco to directly reflect them in the next monthly invoice(s). The direct rebating of SCs in the next wholesale invoice(s) is more optimal from a process standpoint as it reduces the number of communications between Batelco and OLOs.

117. For each rebate of SCs in an invoice; Batelco should include a reference for the OLO to identify the reason of such rebate:
   a. For Penalties for Notification of Expected RFT and RFS Dates and Penalties for RFS Date, the reference shall be the Service Request reference number and, if available, the Connection reference number.
   b. For Penalties for Restoration Time: the reference shall be the trouble ticket number and the Connection reference number.

118. The Penalties for Notification of Expected RFT and RFS Dates shall not be capped.

119. The Penalties for RFS Date shall be capped as described in paragraph 106 above.

120. The Penalties for Restoration Time shall be capped by the Maximum Monthly Penalty Cap which is to be defined in the RO.

Q7. Do you agree with the Authority’s proposed process for the payment of Service Level Penalties? Do you agree that the corresponding rebate(s) shall not be claimed by OLOs but directly reflected by Batelco in the next invoice(s)? Please explain and justify your position.

3.3 Definitions applicable to the Service Level framework

121. In the following subsection, the Authority provides a consolidated list of all definitions that shall apply to the Service Level framework.

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9 In the WLA service description, a Service Credit is defined as 5% of the monthly recurring charge. The Authority considers a Service Credit set at 1% of the MRC to be more convenient to quickly determine the applicable penalties.
## Figure 9: Definitions applicable to the Service Level framework

<table>
<thead>
<tr>
<th>#</th>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Service Levels</td>
<td>means the set of parameters defining the minimum performance expected from the [ ] product and its services. Service Levels include Service Level Terms, and Service Level Penalties.</td>
</tr>
<tr>
<td>2</td>
<td>Service Level Terms</td>
<td>means the set of defined performance targets that must be met by Batelco in relation to the request, delivery, quality management and fault management of the [ ] product and its services.</td>
</tr>
<tr>
<td>3</td>
<td>Service Level Penalties</td>
<td>means the set of defined penalties expressed in Service Credits which are due by Batelco for not having met Service Level Terms.</td>
</tr>
<tr>
<td>4</td>
<td>Service Request Form</td>
<td>means the form used by an OLO to request a service for the [ ] product.</td>
</tr>
<tr>
<td>5</td>
<td>Service Request</td>
<td>means a formal request for a service of the [ ] product. Service Requests include New Connection Requests, Transfer Requests, Upgrade/Downgrade Requests, Migration Request, Reconfiguration Requests, and Cancellation Requests.</td>
</tr>
<tr>
<td>6</td>
<td>New Connection Request</td>
<td>means a Service Request for establishing a new Connection.</td>
</tr>
<tr>
<td>7</td>
<td>Transfer Request</td>
<td>means a Service Request for transferring an existing connection from one operator to another operator. For the avoidance of doubt, the existing connection may be provided by Batelco retail and transferred to an OLO.</td>
</tr>
<tr>
<td>8</td>
<td>Upgrade/Downgrade Request</td>
<td>means a Service Request for upgrading/downgrading the speed of an existing Connection.</td>
</tr>
<tr>
<td>9</td>
<td>Migration Request</td>
<td>means a Service Request for changing the end user address of an existing Connection, requiring disconnection and reconnection of the Connection end point. A “hot migration” happens when the Connection is not disrupted and a “cold migration” when the Connection can be disrupted.</td>
</tr>
<tr>
<td>10</td>
<td>Reconfiguration Request</td>
<td>means a Service Request for reconfiguring the technical parameters of an existing Connection.</td>
</tr>
<tr>
<td>11</td>
<td>Cancellation Request</td>
<td>means a Service Request for cancelling an existing Connection.</td>
</tr>
<tr>
<td>12</td>
<td>Service Request Acknowledgement</td>
<td>means the Service Level for the timely acknowledgment of a Service Request sent by an OLO.</td>
</tr>
</tbody>
</table>
| 13 | Actual Time for Service Request Acknowledgement | means the time period between the following events:  
   a. the OLO sends a Service Request to Batelco, and  
   b. the OLO receives a notice from Batelco acknowledging that the Service Request has been received.                                                                                                                                                                          |
<p>| 14 | Maximum Time for Service Request Acknowledgement | means the maximum Actual Time for Service Request Acknowledgement that Batelco should meet at all times.                                                                                                                                                                                                                               |
|    | Service Request Confirmation      | means the Service Level for the timely acceptance or rejection of a Service Request sent by an OLO.                                                                                                                                                                                                                             |</p>
<table>
<thead>
<tr>
<th>#</th>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
</table>
| 1 | **Actual Time for Service Request Confirmation** | means the time period between the following events:  
- a. the OLO receives a notice from Batelco acknowledging that the Service Request has been received; and  
- b. one of the following three events, whichever happens the soonest:  
  - i. the OLO receives a notice from Batelco indicating that the information provided by the OLO in the Service Request Form is incorrect and/or insufficient to progress the Service Request to the service delivery process; or  
  - ii. Accepted Service Request (explicit acceptance from Batelco) which happens when the OLO receives a notice from Batelco confirming that the information provided by the OLO in the Service Request Form is correct and sufficient to progress the Service Request to the service delivery process; or  
  - iii. Accepted Service Request (deemed acceptance from Batelco) which happens at the end of the Maximum Time for Service Request Confirmation, where absent formal notice from Batelco, the Service Request is deemed to have been accepted by Batelco and thus progressed to the service delivery process. |
| 2 | **Maximum Time for Service Request Confirmation** | means the maximum Actual Time for Service Request Confirmation after which, absent formal notice from Batelco, the Service Request is deemed to have been accepted by Batelco. |
| 3 | **Accepted Service Request** | means the time when a Service Request is explicitly accepted by Batelco or deemed to have been accepted by Batelco. |
| 4 | **Notification of Expected RFT and RFS Dates** | means the Service Level for the timely notification of the Expected RFT Date, the Expected RFS Date, the Maximum RFS Date, the Maximum Delivery Time, and the Maximum Delivery Date to the OLO. |
| 5 | **Actual Time for Notification of Expected RFT and RFS Dates** | means the time period between the following events:  
- a. Accepted Service Request, and  
- b. the OLO receives a notice from Batelco indicating the Expected RFT Date, the Expected RFS Date; the Maximum Delivery Time; and the Maximum Delivery Date. |
| 6 | **Penalties for Notification of Expected RFT and RFS Dates** | means the penalties due by Batelco for not meeting the Maximum Time for Notification of Expected RFT and RFS Dates. |
| 7 | **Expected RFT Date** | means the date at which Batelco expects the service to be ready for test as indicated in the notice of Expected RFT and RFS Dates. The Expected RFT Date must precede the Expected RFS Date by a period of time equal to the Maximum Validation Time. The RFT Date may be modified at a later stage if Batelco or the OLO is not able to meet it. |
| 8 | **Expected RFS Date** | means the date at which Batelco expects the service to be ready for service as indicated in the notice of Expected RFT and RFS Dates. The Expected RFS Date must be set no later than the Maximum Delivery Date. The RFT Date may be modified at a later stage if Batelco or the OLO is not able to meet it. |
| 9 | **Maximum Delivery Time** | means the maximum time within which Batelco must set the Expected RFS Date in the notice of Expected RFT and RFS Dates. The Maximum Delivery Time may differ according to the type of Service Request and/or the availability of access line/access ducts. The Maximum Delivery Time starts at Accepted Service Request. |
| 10 | **Maximum Delivery Date** | means the last working day after which the Maximum Delivery Time lapses. |
| 11 | **Actual Delivery Time** | means the time period between the following events:  
- a. Accepted Service Request, and  
- b. Actual RFS Date. |
<p>| 12 | <strong>Actual RFT Date</strong> | means the date on which the OLO receives a notice from Batelco confirming that the connection has been provisioned the same day and is ready for test. |
| 13 | <strong>Actual RFS Date</strong> | means the date on which the OLO receives the RFS Certificate from Batelco. |</p>
<table>
<thead>
<tr>
<th>#</th>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Actual Validation Time</td>
<td>means the time period(s) between the following events:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>a. Actual RFT Date which happens when the OLO receives a notice from Batelco confirming that the connection has been provisioned the same day and is ready for test; and</td>
</tr>
<tr>
<td></td>
<td></td>
<td>b. one of the following two events, whichever happens the soonest:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>i. the OLO sends a notice to Batelco confirming that the connection is performing in accordance with the Acceptance Criteria; and</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ii. the end of the Maximum Validation Time.</td>
</tr>
<tr>
<td></td>
<td>The Actual Validation Time is suspended between the following events, if such events occur:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>a. OLO sends a notice to Batelco indicating that the connection is not performing in accordance with the Acceptance Criteria; and</td>
</tr>
<tr>
<td></td>
<td></td>
<td>b. the OLO receives a notice from Batelco indicating that the connection has been re-provisioned.</td>
</tr>
<tr>
<td></td>
<td>Maximum Validation Time</td>
<td>means the maximum Actual Validation Time after which, absent formal notice from the OLO, Batelco may issue the RFS Certificate.</td>
</tr>
<tr>
<td></td>
<td>Acceptance Criteria</td>
<td>means the set of technical parameters including the Quality of Service Parameters, and test procedures, which the Connection has to meet before a Service Request can be considered as completed.</td>
</tr>
<tr>
<td></td>
<td>RFS Certificate</td>
<td>means the certificate issued by Batelco to the OLO to confirm that:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>a. the connection has been provisioned and tested by Batelco;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>b. the connection is properly registered in all of Batelco’s systems (e.g. OSS/BSS, service level monitoring platform, fault reporting system etc.);</td>
</tr>
<tr>
<td></td>
<td></td>
<td>c. the connection has been validated by the OLO (or deemed to have been validated by the OLO if the Maximum Validation Time has lapsed); and</td>
</tr>
<tr>
<td></td>
<td></td>
<td>d. the connection is ready for service and the OLO will be invoiced accordingly.</td>
</tr>
<tr>
<td></td>
<td>Service Level for RFS Date</td>
<td>means the Service Level for the timely issuance of the RFS Certificate to the OLO.</td>
</tr>
<tr>
<td></td>
<td>Maximum RFS Date</td>
<td>means the last day on which the OLO may receive the RFS Certificate, after which Batelco is subject to Penalties for RFS Date.</td>
</tr>
<tr>
<td></td>
<td>Penalties for RFS Date</td>
<td>means the penalties due by Batelco for not meeting the Maximum RFS Date</td>
</tr>
<tr>
<td></td>
<td>QoS Parameters</td>
<td>means the set of technical parameters, which the Connection has to meet to be considered available. N.B. OLO may only report a fault if a Connection is not performing according to the QoS Parameters.</td>
</tr>
<tr>
<td></td>
<td>Fault Acknowledgment Time</td>
<td>means the Service Level for the timely acknowledgement of a fault reported by the OLO.</td>
</tr>
<tr>
<td></td>
<td>Actual Fault Acknowledgment Time</td>
<td>means the time period between the following events:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>a. the OLO reports a fault to Batelco , and</td>
</tr>
<tr>
<td></td>
<td></td>
<td>b. the OLO receives a trouble ticket from Batelco for the reported fault.</td>
</tr>
<tr>
<td></td>
<td>Maximum Fault Acknowledgment Time</td>
<td>means the maximum Actual Fault Acknowledgment Time that Batelco should meet at all times.</td>
</tr>
<tr>
<td></td>
<td>Response Time</td>
<td>means the Service Level for the timely start of troubleshooting of a fault.</td>
</tr>
<tr>
<td>#</td>
<td>Term</td>
<td>Definition</td>
</tr>
<tr>
<td>---</td>
<td>----------------------------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>Actual Response Time</td>
<td>means the time period between the following events:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>a. the OLO reports a fault to Batelco, and</td>
</tr>
<tr>
<td></td>
<td></td>
<td>b. the OLO receives a notice from Batelco confirming that the troubleshooting of the fault has started (either remotely or on site).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Once a Batelco technician has started troubleshooting the fault, Batelco is required to regularly update the OLO of the progress made to restore the Connection, and to provide an indication of the anticipated restoration time.</td>
</tr>
<tr>
<td></td>
<td>Maximum Response Time</td>
<td>means the maximum Actual Response Time that Batelco should meet at all times.</td>
</tr>
<tr>
<td></td>
<td>Restoration Time</td>
<td>means the Service Level for the timely restoration of a Connection affected by a fault.</td>
</tr>
<tr>
<td></td>
<td>Actual Restoration Time</td>
<td>means the time period between the following events:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>a. the OLO reports a fault to Batelco, and</td>
</tr>
<tr>
<td></td>
<td></td>
<td>b. the OLO receives a notice from Batelco indicating the connection has been restored and the trouble ticket closed.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Batelco is allowed to close a trouble ticket only if one of the following conditions is met.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>a. Batelco provides a proof (i.e. test results) that the connection is performing in accordance with the QoS Parameters; or</td>
</tr>
<tr>
<td></td>
<td></td>
<td>b. Batelco has received a confirmation from the OLO that the service is performing in accordance with the QoS Parameters.</td>
</tr>
<tr>
<td></td>
<td>Maximum Restoration Time</td>
<td>means the maximum Actual Restoration Time after which Batelco is subject to Penalties for Restoration Time.</td>
</tr>
<tr>
<td></td>
<td>Penalties for Restoration Time</td>
<td>means the penalties due by Batelco for not meeting the Maximum Restoration Time.</td>
</tr>
<tr>
<td></td>
<td>Service Credit</td>
<td>means one per cent (1%) of the applicable monthly recurring charge for the Connection.</td>
</tr>
<tr>
<td></td>
<td>Maximum Monthly Penalty Cap</td>
<td>means the maximum Penalties for Restoration Time the OLO is entitled to for a specific Connection, on a monthly basis, as a result of Batelco not meeting the Maximum Restoration Time.</td>
</tr>
</tbody>
</table>

Source: the Authority
3.4 Summary table of Service Levels

122. The Authority considers that Batelco should insert a summary table of the applicable Service Levels in the annex of the relevant RO service descriptions. Such a summary table should follow the below format:

**Figure 10: Format of the table summarizing Service Levels**

<table>
<thead>
<tr>
<th>Service Levels</th>
<th>Service Level Terms</th>
<th>Service Level Penalties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service request process</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Service Request Acknowledgment</td>
<td>Maximum Time for Service Request Acknowledgment: □</td>
<td></td>
</tr>
<tr>
<td>Service Request Confirmation</td>
<td>Maximum Time for Service Request Confirmation: □</td>
<td></td>
</tr>
<tr>
<td>Service delivery process</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Notification of Expected RFT and RFS Dates</td>
<td>Maximum Time for Notification of Expected RFT and RFS Dates: □</td>
<td>Penalties for Notification of Expected RFT and RFS Dates: □</td>
</tr>
<tr>
<td>Service Level for RFS Date</td>
<td>Maximum Delivery Time: □</td>
<td>Penalties for RFS Date: □</td>
</tr>
<tr>
<td></td>
<td>N.B. Actual RFS Date ≤ Maximum RFS Date ≤ Maximum Delivery Date</td>
<td></td>
</tr>
<tr>
<td>Acceptance Criteria</td>
<td>Maximum Validation Time: □</td>
<td></td>
</tr>
<tr>
<td>Source: the Authority</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: the Authority
Q8. Do you have any comments on the Service Level definitions proposed by the Authority? Please explain and justify your position.

SUMMARY OF SUBMISSIONS ON SECTION 3

123. In this subsection, the Authority will add a summary of the submissions and cross-submissions (if any) received from stakeholders on section 3 (Framework for defining Service Levels).

THE AUTHORITY’S FINAL CONCLUSIONS ON SECTION 3

124. In this subsection, the Authority will provide its final views and conclusions with regard to section 3 (Framework for defining Service Levels).
4 The need for a forum on Batelco’s RO

125. In the following section, the Authority proposes to create of a forum on Batelco’s RO.

CONSULTATION TEXT

126. The Authority is considering to create a forum that will be meeting from time to time with relevant stakeholders, with the purpose of providing a platform to discuss matters related to the active wholesale access products and services included in Batelco’s RO. Such forum will be referred hereafter as Forum on Batelco’s RO (‘FRO’).

127. The Authority considers that certain RO subjects, due to their technical or procedural nature, should first be discussed together with OLOs and Batelco before an informed regulatory decision can be taken.

128. The need to set up the FRO was evidenced during a series of meetings that the Authority held with OLOs at the end of October 2014. The purpose of such meetings was to understand what enhancements to Batelco’s wholesale domestic data connectivity products would be necessary to ensure that OLOs could compete more effectively with Batelco in the downstream retail markets. OLOs also discussed some enhancements that they believe would be required before considering Batelco’s wholesale access products for the purpose of radio site backhauling.

129. As some of the discussions held during such meetings were of a very technical nature, the Authority considers that they should first be held during meetings of the proposed FRO. This would ensure that any concerns raised by different parties are fully considered before proposing draft regulatory decisions for consultation.

130. In summary, the establishment of the proposed FRO would have the following purposes:
   a. understand the views of OLOs and Batelco with regard to the terms that apply to regulated wholesale products and services;
   b. gather information for the purpose of taking better informed preliminary decisions that would then be consulted with the industry;
   c. provide clarifications as needed on changes to the RO that are ordered or approved by the Authority; and
   d. monitor the implementation of ordered or approved changes to the RO and address any issues that may arise during such implementation.

Terms of reference for an effective FRO

131. For the FRO to be effective, the Authority proposes that the below terms of reference should apply:
   a. Scope: the scope of the FRO will be limited to technical and procedural matters regarding regulated wholesale access products and services (i.e. technical
configurations and wholesale processes). However, the FRO should not provide a platform to discuss issues that may arise for a specific wholesale Connection (e.g. fault impacting a given Bitstream Connection at a specific customer location). In other words, only the general terms (technical or procedural terms) applicable to regulated products and services should be discussed during meetings of the FRO, not specific situations.

b. **Governance and participation:** the Authority will chair the FRO and own the agenda of FRO meetings. Batelco and all interested OLOs should be able to participate to FRO meetings. Where relevant and appropriate, the Authority may propose to restrict the participation to a FRO meeting to a limited number of operators and/or participants per operator.

c. **Periodicity and location:** the FRO will meet on a regular basis and the Authority anticipates that at least two FRO per year would be held. FRO meetings will be held at the Authority’s premises. The Authority does not propose any FRO meeting to take place during the period starting from (a) the issuance of a draft RO Order for public consultation and ending with (b) the issuance of the corresponding final RO Order.

d. **Documentation:** minutes of FRO meetings will be taken by the Authority. In addition to forwarding meeting minutes to FRO participants, the Authority reserves the right to publish such minutes on its website, if deemed appropriate.

132. The Authority anticipates that the first FRO meeting would cover the following agenda items:

a. Presentation of the FRO’s terms of reference; and;

b. Discussions regarding Batelco’s implementation of the price and non-price terms included in this Order.

Q9. Do you agree with the Authority’s proposed creation of a Forum on Batelco’s RO? Please explain and justify your position. According to you, what should be the terms of reference of such forum to ensure its effectiveness?

**SUMMARY OF SUBMISSIONS ON SECTION 4**

133. In this subsection, the Authority will add a summary of the submissions and cross-submissions (if any) received from stakeholders on section 4 (The need for a forum on Batelco’s RO).
THE AUTHORITY’S FINAL CONCLUSIONS ON SECTION 4

134. In this subsection, the Authority will provide its final views and conclusions with regard to section 4 (The need for a forum on Batelco’s RO).
5 Review of non-price terms applicable to wholesale data connectivity products and services

135. In the following section, the Authority reviews the non-price terms applicable to the wholesale connectivity products and services.

CONSULTATION TEXT

5.1 Background

136. As stated by the Authority in the “Determination of Significant Market Power and Determination of Dominant Position in the Markets for Domestic Data Connectivity Services” issued on 10 April 2014 under reference MCD/04/14/026 (hereafter, the “Determination”), the Authority considers that Batelco should introduce additional ancillary services, enhance existing Service Levels, and introduce Service Levels when inexistent. This would enable OLO to compete more effectively against Batelco in the retail market for connectivity services and to promote the use of the wholesale product and services by OLOs for wireless site backhauling and/or core network transmission.10

137. As previously indicated above (see paragraph 128), the Authority has held several meetings with OLOs at the end of October 2014 to discuss potential enhancements to Batelco’s wholesale data connection products.

138. Among the different suggestions for improvements, OLOs stressed that it would be important to consider:

a. **Reviewing and enhancing the current SLAs applicable to the WLA service:**
   When a WLA Connection does not meet the Service Levels terms defined for the WLA product, OLOs consider that Service Credits should be automatically reflected by Batelco as rebates in the corresponding invoices. The possibility of introducing a premium support with higher Service Levels was also discussed as OLOs indicated that certain customers require a guarantee that the service would be restored in no time. This particularly applies to cases where WLA Connections are used as inputs by OLOs to provide end-to-end international connections or to meet the higher requirements demanded by certain customers (e.g. banking sector). OLOs finally mentioned the possibility of introducing clearly defined protection options for WLA Connections.

b. **Introducing higher speeds:** with the continued growth in mobile data usage, OLOs indicated that the average backhaul traffic per radio site had increased considerably over the last 2-3 years. The increase of traffic per site is expected to

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10 For more information on the Determinations, please refer to page 134 “
B.3 Domestic data connectivity market review (2013-2014)”.

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continue in the coming years, notably with the rapid uptake and development of LTE services. One of the OLOs mentioned that the combined backhaul traffic of a typical busy radio site was currently in the range of 300Mbit/s to 500Mbit/s, and such traffic was expected to increase up to 1Gbit/s in the coming 3-5 years. Moreover, as OLOs tend to deploy hubs to aggregate traffic of several radio sites (i.e. star topology with traffic aggregators), there would be a need for a reliable fibre-based wholesale product in the range of 1 to 5Gbit/s.

c. **Introducing a “pre-sale process”:** under such a process, OLOs would quickly be informed of the availability of a fibre access at a specific location in Bahrain. This would enable OLOs to be more responsive to customer requests (i.e. inform potential customers of the expected provisioning time for a new connection).

d. **Reviewing the approach for the recovery of costs incurred by Batelco for passive network extensions:** in cases where a new CAT/LLCO or WLA Connection requires an extension of Batelco’s passive network (i.e. where there is a need to build an additional duct path and/or pull additional fibre cables to deliver a new CAT/LLCO or a WLA Connection), several OLOs have highlighted that the costs of such network extensions are currently fully recovered by Batelco on a time and material basis (see for example, charge items 2-16.10 in RO Schedule 3). While some OLOs understand that in specific cases, the cost of Batelco’s network extension should be borne by OLOs (e.g. duct lead-in to a radio site), they do not agree that Batelco should systematically seek to recover the full invested amount from OLOs. In such cases, OLOs stressed that, while Batelco’s network extensions have been fully paid by OLOs, Batelco nonetheless retains the full ownership of such extensions and may use them to provide other services to OLOs and/or retail customers. OLOs therefore consider that they should not be financing the extension of Batelco’s fibre access network, and that, in the majority of cases; costs should be fully borne by Batelco. If the costs of Batelco’s fibre-access network extensions are to be fully recovered from OLOs, OLOs consider that a fair downward adjustment to the applicable MRC should apply.

e. **Introducing the same terms (including SLAs) for the CAT/LLLCO services:** OLOs have insisted that the CAT/LLCO services should have the same terms and Service Levels as the WLA service.

139. In the following sections, the Authority discusses the changes that Batelco would be required to introduce in its RO to address the above comments made by OLOs.

5.2 Standardized service description for all wholesale data connectivity products and services

5.2.1 Basis for the proposed standardized service description

140. The Authority considers that there would be some merit in having standardized service descriptions for the existing WLA, CAT, and LLCO services as they all provide symmetrical data connectivity between a Point of Presence (“POP”) of the Access Seeker and either a) an End User premises; or b) an other POP of the Access Seeker.

141. Under this approach, the main document of each service description will be identical, with exception to the product name and the product definition. Each service description will
however have different technical annexe(s) which will provide details on the technical
parameters of the product.

142. Furthermore, the Authority considers that the high-speed CAT and high-speed LLCO
services should be merged under one service description. The Authority invites Batelco to
propose a name for such service description as part of its response to the draft Order
consultation. Until such time as Batelco proposes a name, the Authority will refer to this
product as “Wholesale Data Connection” (hereafter “WDC”). This name is temporarily
set by the Authority for ease of reference in this document. For the avoidance of doubt, the
Authority does not propose to merge the low-speed CAT and LLCO circuits (≤ 2 Mbit/s)
under the WDC.

143. The use of standardized service descriptions for the WLA and WDC products and services
is pertinent for the following reasons:

   a. **One defined wholesale market:** In its “Determination of Significant Market Power
      and Determination of Dominant Position in the Markets for Domestic Data
      Connectivity Services” issued on 10 April 2014 (ref: MCD/04/14/026), the Authority
      has only defined one wholesale market for the provision of domestic data
      connections. With exception to technical terms, there is no justifiable reason for
      non-price terms to differ between the WLA and WDC service descriptions.

   b. **Reduction of regulatory costs:** Standardized WLA and WDC service descriptions
      would reduce the regulatory costs incurred by both Batelco and the Authority for the
      maintenance, review and update of the RO service descriptions.

   c. **Same functionality:** All current wholesale data connection products, including the
      CAT, the LLCO and the WLA are fundamentally the same: they are all defined by
      Batelco as “wholesale dedicated private leased circuit service” and are used to
      provide dedicated data connection between two distant geographic end-points
      located in Bahrain:

      i. As indicated by their respective definitions (see below), CAT and LLCO only
differ according to the restriction placed by Batelco on the location of the
      connection’s end-points. For the CAT, one end-point must be a POP, and the
      other, an End User premises (i.e. customer site); while for the LLCO, both
      end-points must be POP. It is therefore sensible to regroup the CAT and
      LLCO under one service description called WDC.

      “The CAT Service is a wholesale dedicated private
      leased circuit service for carrying Access Seeker’s traffic
      within Bahrain between an End User premises and an
      Access Seeker’s Point of Presence.”

      “The Local
      Leased Circuit for OLO (LLCO) Service is a wholesale
      dedicated private leased circuit service for carrying

      11  SERVICE DESCRIPTION 2-6 CUSTOMER ACCESS TAIL (CAT) SERVICE, Batelco’s RO.
ii. The WLA is also defined in similar terms by Batelco: "a wholesale dedicated private leased circuit service within the Kingdom of Bahrain between a Point of Presence of an Access Seeker and an End User Premises / Point of Presence providing guaranteed symmetrical bandwidth." While CAT/LLCO circuits use Batelco's SDH transmission network, WLA Connections use its MPLS transmission network. The two transmission networks have different costs. This results in different regulated charges for the CAT/LLCO and the WLA and justifies maintaining two distinct but standardized service descriptions. However, there is no reason that would justify the maintenance of different non-price terms for such products.

5.2.2 Format of the standardized service descriptions

144. As the WLA service description (i.e. SERVICE DESCRIPTION 2-16: WHOLESALE LOCAL ACCESS SERVICE (WLA)) was the latest RO service description reviewed and approved by the Authority, the Authority proposes to consider it as a starting point for the standardized service descriptions applicable to both the WLA and WDC products.

145. The Authority is of the view that the generic terms of the WLA product should also apply to the proposed unified WDC product. Any terms that would be specific to either the WLA or WDC product could be placed in an annex of the corresponding service description (e.g. technical parameters, service tests, technical diagram etc.).

5.3 WDC product as an alternative to a regulated dark fibre product

5.3.1 Background information on the dark fibre discussions

146. In section 8 of its “Determination of Significant Market Power and Determination of Dominant Position in the Markets for Domestic Data Connectivity Services” issued on 10 April 2014 (ref: MCD/04/14/026), the Authority identified dark fibre as a potential remedy that could be introduced by Batelco at the wholesale level to promote competition in the downstream retail market and to provide a solution to address OLOS’ need for backhaul transmission:

“The Authority therefore believes that Batelco should offer access to dark fibre [...]. Once such a fit-for-purpose dark fibre access product is available and being used, the Authority may consider allowing for the withdrawal of the existing duct access product from Batelco’s Reference Offer.”

12 SERVICE DESCRIPTION 2-5: LOCAL LEASED CIRCUIT FOR OLO (LLCO), Batelco’s RO.
13 SERVICE DESCRIPTION 2-16: WHOLESALE LOCAL ACCESS SERVICE (WLA), Batelco’s RO.
147. Accordingly, the Authority has taken a number of steps to investigate with Batelco the technical feasibility of introducing a dark fibre service as a remedy in Batelco’s RO. Such steps are being summarized in the below table.

**Figure 11: Timeline of discussions regarding the potential introduction of a dark fibre product or an equivalent active wholesale product**

<table>
<thead>
<tr>
<th>Date</th>
<th>Description</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 April 2014</td>
<td>The Authority issues the “Determination of Significant Market Power and Determination of Dominant Position in the Markets for Domestic Data Connectivity Services”.</td>
<td>MCD/04/14/026</td>
</tr>
<tr>
<td>11 May 2014</td>
<td>The Authority sends a letter to OLOs requesting them to provide comments on the potential introduction of a dark fibre product in Batelco’s RO. OLOs are invited to provide such comments before 22 May 2014.</td>
<td>MCD/05/14/066</td>
</tr>
<tr>
<td>29 June 2014</td>
<td>The Authority sends a letter to Batelco to request Batelco to submit a draft service description for the dark fibre product for the Authority’s review. In such letter, the Authority sets out the key requirements which it expects the draft dark fibre service description should cover. The requirements are based on the feedbacks given by OLOs to the Authority during May 2014.</td>
<td>MCD/06/014/087</td>
</tr>
<tr>
<td>7 July 2014</td>
<td>At Batelco’s request, the Authority organizes a meeting to discuss the requirements of the dark fibre product. During the meeting, Batelco claims that it would be challenging to introduce such product for reasons including but not limited to: a) issues with database records on fibre availability and usage; and b) shortage of fibre pairs in junction cables linking Batelco’s service nodes.</td>
<td>N/A</td>
</tr>
<tr>
<td>4 August 2014</td>
<td>In its response to the Authority’s letter dated 29 June, Batelco sets out its main issues and concerns with regard to the introduction of a dark fibre product. Batelco also submits a draft service description for a service called “WIRELESS BACKHAUL SERVICE” aimed at addressing backhaul connectivity requirements of operators holder of a fixed wireless or mobile license.</td>
<td>GCL/296/14</td>
</tr>
<tr>
<td>9 April 2015</td>
<td>During a meeting held at the Authority’s premises, Batelco presents its proposed Wireless Operator Backhaul Service based on DWDM transmission.</td>
<td></td>
</tr>
<tr>
<td>29 April 2015</td>
<td>Batelco submits costing information for the Wireless Operator Backhaul Service. In addition, Batelco provides the list of service nodes which currently host DWDM equipment.</td>
<td>GCL/119/15</td>
</tr>
<tr>
<td>29 April 2015</td>
<td>The Authority shares its concerns with Batelco on the costing of the Wireless Operator Backhaul Service and requires Batelco to submit its proposed pricing for such service.</td>
<td></td>
</tr>
<tr>
<td>17 May 2015</td>
<td>Batelco confirms by email its proposed pricing for the Wireless Operator Backhaul Service.</td>
<td></td>
</tr>
<tr>
<td>28 May 2015</td>
<td>Batelco submits additional information regarding the Wireless Operator Backhaul Service and other regulated wholesale data connection products.</td>
<td>GCL/140/15</td>
</tr>
</tbody>
</table>

Source: the Authority

148. In its letter dated 4 August 2014, Batelco claimed that it has serious concerns and issues with regard to the introduction of a regulated dark fibre product. Batelco particularly highlighted certain issues with the technical feasibility of a dark fibre product:

a. **Issues with database records**: Batelco indicates that the database records of existing spare ducts and spare fibre are fragmented. Batelco further submits that a
consolidated database, as envisaged by the Authority, would require time and cost to develop.

b. **Congestion in junction cables:** Batelco claims that it has concerns over capacity congestion in its existing junction cables. According to Batelco, the launch of an “any to any” dark fibre service would exacerbate this congestion problem in highly-demanded areas, especially when taking into account reasonable capacity requirements of its retail division.

149. Together with its letter dated 4 August 2014, Batelco also submitted a draft service description for an active wholesale active data connection product called “Wireless Backhaul Service” aimed at addressing backhaul connectivity requirements of operators holder of a fixed wireless license or mobile license.

150. Given the uncertainties regarding the Government policy on the National Broadband Network (“NBN”) in Bahrain, the Authority decided several months later to consider Batelco’s proposed active wholesale product as an alternative to dark fibre. Accordingly, the Authority invited Batelco to present its proposed active wholesale product.

151. On 9 April 2015, Batelco presented a revised version of its proposed product called Wireless Operator Backhaul Service (hereafter referred as “WOBS”). Batelco’s proposed WOBS is described in the following section.

### 5.3.2 Batelco’s proposed active wholesale data connection product as an alternative to a regulated dark fibre product

152. The following section details the main characteristics of the WOBS that was proposed by Batelco. Such characteristics are organised around key topics, including:

a. Proposed service definition;

b. Proposed technical parameters;

c. Proposed non-price terms, including Service Levels; and

d. Proposed price terms.

#### Proposed service definition

153. Batelco’s proposed WOBS is defined as:

“The Wireless Operator Backhaul Service (WOBS) is a wholesale uncontended symmetrical dedicated private leased circuit service within the Kingdom of Bahrain between a Wireless Radio Site of the Access Seeker and the Access Seeker aggregation Point of Presence.”

14 Batelco calls ‘junction cables’ the cables that interlink its exchanges.
Proposed technical parameters

154. Batelco’s proposed WOBS is intended to be delivered using Batelco’s Dense Wavelength Division Multiplexing ("DWDM") network. The proposed WOBS provides a seamless end-to-end transmission between a wireless operator’s mobile tower and its main hub or POP.

155. The technical standards referred to by Batelco for the WOBS are:
   a. ITU-T G.709: Interfaces for the Optical Transport Network (OTN); and
   b. IEEE 802.3z: IEEE standards for Gigabit Ethernet in the LAN/MAN environment.

156. According to Batelco, customer VLANs or other labels will not be detected by the network. In addition, OLOs will be able to configure VLANs independently between customer equipment at the wireless site and customer aggregation site equipment.

157. The WOBS connections are aggregated and delivered at the OLO’s POP through an aggregation link, as can be seen in the following figure provided by Batelco as part of the WOBS service description.

Figure 12: Batelco’s service diagram for the proposed WOBS

Source: Batelco’s WOBS service description dated 9 April 2015
158. Batelco proposes a protection mechanism for the WOBS aggregation link:

"MSP 1+1 protection
Sub-Network Connection Protection (SNCP)
Silver auto switching of 50ms."\(^{15}\)

159. An optional level of protection is also proposed by Batelco for WOBS connections:

"Option of providing 1+1 fiber connection to the Wireless Radio Site should this be required by the Access Seeker."\(^{16}\)

160. Batelco proposes the following speeds for the WOBS connections:

a. 300Mbit/s;
b. 500Mbit/s;
c. 1,000Mbit/s;
d. 2,500Mbit/s; and
e. 10,000Mbit/s.

161. Batelco proposes that the following QoS parameters for the WOBS:

a. Packet loss: none;
b. Jitter: none; and
c. Latency: 5ms.

162. Finally, in an email dated 29 April 2015 (ref: GCL/119/15), Batelco indicated that the following nine (9) service nodes were equipped with DWDM core equipment:

a. Sanad;
b. Salmaniya;
c. Isa Town;
d. Riffa;
e. Ras Abu Jarjoor;
f. Mahooz;
g. Muharraq;
h. Hidd industrial; and
i. Juffair.

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\(^{15}\) Batelco’s presentation of the WOBS dated 9 April 2015
\(^{16}\) ibid
Proposed non-price terms, including SLAs

163. The service description of the proposed WOBS is very similar to the existing WLA service description. However, the proposed WOBS terms differ from the WLA terms. The main differences are listed below:

a. Access restrictions: compared to the WLA service, Batelco proposes to introduce some restrictions for access the WOBS. Such restrictions include:
   i. Access restrictions based on the type of license: Batelco proposes that only holders of an Individual Mobile Telecommunications Licence (IMTL) or a National Fixed Wireless Services Licence (NFWS) should have access to the WOBS.
   ii. Access restrictions based on the use of the service: Batelco proposes that the WOBS should only be used for the provision of backhaul transmission to Wireless Radio Site. Wireless Radio Site is defined by Batelco as follows "Wireless Radio Site means a permanent physical location in Bahrain owned or controlled by the Access Seeker and from which location the Access Seeker transmits wireless signal or a Wireless Colocation Site."
   iii. Access restrictions based on the location of the OLO’s POP: it would appear that Batelco proposes to introduce restrictions with regard to the geographic location of the OLO’s POP which, contrary to a WLA Connection, cannot be a Batelco collocation facility.
   iv. Access restrictions based on a minimum initial order: Batelco proposes that the WOBS should only be accessible for a minimum initial order of 50 Connections.

b. Service period: compared to the WLA, Batelco proposes a different minimum service period and renewed minimum service period for the WOBS:
   i. Minimum service period: Batelco proposes a minimum service period of twenty-four (24) calendar months for the WOBS, as opposed to twelve (12) calendar months for the WLA.
   ii. Renewed minimum service period: similarly, Batelco proposes that, upon expiry of the service period, a renewed minimum service period of twelve (12) calendar months applies to the WOBS as opposed to one (1) calendar month for the WLA service

164. The Service Levels proposed for the WOBS are, to a large extent, similar to those offered for the WLA, with exception to the following:

a. The Service Availability of 99.99% is being proposed for the WOBS instead of 99.7% for the WLA;

b. The maximum Ready for Test lead time of the WOBS is set at 90 Working Days instead of 15 Working Days, 30 Workings Days and “Exceptional Delivery Date” for the WLA (the RFT date applicable to the WLA varies depending on whether the fibre is readily available and can accommodate a Connection, or whether Batelco is required to build new access ducts to deliver a new Connection).
**Proposed price terms**

165. Batelco proposed the following charges for the WOBS.

**Figure 13: Batelco’s proposed charges for the WOBS**

<table>
<thead>
<tr>
<th>Speed in Mbit/s</th>
<th>MRC (in BD per month)</th>
</tr>
</thead>
<tbody>
<tr>
<td>300</td>
<td>3,787</td>
</tr>
<tr>
<td>500</td>
<td>4,046</td>
</tr>
<tr>
<td>1,000</td>
<td>4,574</td>
</tr>
<tr>
<td>2,500</td>
<td>5,775</td>
</tr>
<tr>
<td>10,000</td>
<td>9,769</td>
</tr>
</tbody>
</table>

**Installation Charges**

- BD500 per WOBS Connectivity.
- Any excess construction and/or Access Network expansion charges may apply.

Source: Batelco’s WOBS service description dated 9 April 2015

5.3.3 **Batelco’s proposed WOBS to be offered as WDC product**

166. As mentioned above, the Authority is willing to consider Batelco’s proposed WOBS as an alternative to a regulated dark fibre product. The Authority’s decision is motivated by a number of factors including:

   a. the apparent shortage of unused fibre pairs in the junction cables connecting Batelco’s service nodes, which, according to Batelco, would make a dark fibre service difficult to implement; and
   
   b. the current lack of details regarding the plan that will cover the implementation of the Government policy on NBN.

167. As the DWDM network has been principally used by Batelco to offload traffic from its legacy SDH transmission network, the Authority considers that it is judicious for the proposed WOBS to be offered as WDC product, which is to combine the high-speed CAT and LLCO services.

168. The Authority is also confident that the new defined WDC product, once market tested, will also provide a sound alternative to the duct access rental product currently being offered by Batelco.

169. For the reasons set out in the above subsections, the Authority therefore orders Batelco the following:

   a. Batelco shall continue to offer the WLA product which shall be defined as “The Wholesale Local Access (WLA) product is an active wholesale product providing symmetric and guaranteed data connectivity within the Kingdom of Bahrain between a Point of Presence of an Access Seeker and an End User Premises / Point of Presence.”
b. Batelco shall combine the high-speed CAT service and the high-speed LLCO service under a unified service description provisionally called ‘Wholesale Data Connection’ or ‘WDC’ product.

c. Batelco shall offer the WDC product which shall be defined as “The Wholesale Data Connection (WDC) product is an active wholesale product providing symmetric, synchronous, dedicated, and uncontended data connectivity within the Kingdom of Bahrain between a Point of Presence of an Access Seeker and an End User Premises / Point of Presence.”

d. From a technical standpoint, WDC shall correspond to both the high-speed CAT/LLCO and the WOBS proposed by Batelco. WDC Connections shall use Batelco’s SDH transmission network or Batelco’s DWDM transmission (or a combination of the two). For cost efficiency purposes, Batelco may first aggregate WDC traffic via Ethernet switches or via SDH aggregation rings before transmitting such WDC traffic on its DWDM network.

e. Batelco shall consider the current WLA service description as a starting point for the definition of the revised WLA service description and the new unified WDC service description.

f. Batelco shall ensure that the WLA and WDC service description are standardized to the maximum extent possible:
   i. the WLA and WDC service descriptions shall have the same structure, including main document and annexes;
   ii. the main document of the WLA and WDC service descriptions shall be identical, with exception to the product name and product definition.
   iii. the terms which are specific to either the WLA or the WDC product shall be annexed to the service description. This includes technical parameters, service tests, technical diagram, Service Request Form and other specific information.

g. On the effective implementation date of this Batelco Order, Batelco shall treat existing CAT, LLCO and WLA Connections as follow:
   i. the existing low-speed legacy CAT and LLCO circuits shall remain as is;
   ii. the existing low-speed NGN-based CAT and LLCO circuits (i.e. speed ≤ 2 Mbit/s) shall become WLA Connections; and
   iii. the existing high-speed SDH-based CAT and LLCO circuits (i.e. DS3 speed and above) shall become WDC Connections.

5.4 Review of the non-price terms applicable to the WLA and WDC products and services

170. While the Authority is willing to accept Batelco’s proposed WOBS as an alternative to a regulated dark fibre product, it considers that the price and non-price terms proposed by Batelco for such product are unfair, unreasonable and discriminatory, and as result shall not be the terms applicable to the WDC.
171. For instance, the Authority considers that the access restrictions that Batelco wishes to introduce for the WOBS are unjustified (see above paragraph 163.a). It is not clear to the Authority why Batelco wishes to limit access to the WOBS to only those licensees holding a mobile or fixed wireless network license. It is likely that other OLOs may also be interested in such a product for other purposes, which could include the provision of core transmission capacity between OLO’s core nodes, the provision of data connections to large corporate entities, or the provision of transmission links from cable landing stations.

172. Similarly, the Authority considers that the CAT and LLCO non-price terms shall not be used as a basis for defining WDC terms as they do not contain any Service Levels at present.

173. The Authority finally considers that some of the non-price terms currently applicable to the WLA should also be revised to ensure that they are fair and reasonable.

174. In the following sections, the Authority reviews the non-price terms applicable to the WLA and the WDC and sets the terms which it considers to be fair, reasonable and non-discriminatory.

5.4.1 Over recovery of costs incurred by Batelco for fibre access network extensions

175. Having regard to the discussions with OLOs during the meetings held in October 2014, the Authority is concerned that, when an OLO pays a one-off charge to Batelco to cover the costs incurred for extending Batelco’s fibre access network to a new location, Batelco may actually be over recovering its costs.

176. The costs incurred by Batelco for extending the reach of its fibre access network to a new location include:
   a. costs of carrying out desk study, field study and coordination;
   b. material costs (ducts, manholes, joints, fibre cables etc.); and
   c. costs of work (trenching, ducting, construction of manholes, pulling of fibre cables, jointing and splicing etc.).

177. For such costs, Batelco currently charges:
   a. a Non-Recurring Charge (“NRC”) based on time and material (e.g. for the WLA product, see charge item 2-16.10 “Additional work (e.g. relocation of Aggregation Link or laying access copper or fibre)” in the RO Schedule 3); and
   b. regulated Monthly Recurring Charges (“MRC”) for the wholesale Connection which include the unit cost of fibre access (e.g. for the WLA, see item 2-16.1 “Monthly recurring tariffs per WLA Connection”).

178. Whilst the Authority considers that Batelco should only be authorized to recover efficiently incurred costs (and thus prevented from over-recovering costs or recovering inefficiently incurred costs), the Authority is also cognisant that Batelco is currently under no obligation to extend the reach of its existing fibre access network. In other words, Batelco is subject to an access obligation but not to a deployment obligation.

179. The Authority is therefore concerned that the introduction of limitations on Batelco’s ability to recover fibre access deployment costs through a NRC may have the unintended
adverse effect of limiting network investment (whereby Batelco would reject any Service Request made by an OLO to Batelco for a WLA or WDC Connection at a location where access fibre is not yet available). At the same time, the Authority remains of the view that Batelco should not seek to over recover fibre access deployment costs. The Authority has identified two approaches that could be followed to ensure that this objective is met:

a. Based on historic wholesale invoices, the Authority could perform a downward adjustment to the unit cost of fibre access (i.e. Network Element AN08 in Batelco’s regulatory accounts) to offset any costs that Batelco has already recovered through NRCs based on time and material; or

b. Batelco could voluntarily introduce certain limitations on the recovery of access network deployment costs through NRCs.

180. The Authority is of the view that the second approach is the more appropriate way forward and proposes that Batelco should only seek to recover the costs of deploying a fibre access through a NRC when the additional passive infrastructure that has been deployed would be for the OLO’s exclusive use in the foreseeable future (i.e. next 3 years). If the additional passive infrastructure that has been deployed is likely to be used for other purposes (i.e. to provide other retail or wholesale services), Batelco shall only seek to recover the cost of deployment by the MRC.

181. To justify such an approach, the Authority highlights the following:

a. Fibre access costs are already being recovered by Batelco through the regulated MRC of Connections, which include the unit cost of fibre access (the costs incurred for fibre access deployment are being capitalized by Batelco and, as such, are considered in the calculation of the unit cost of fibre access).

b. Except for cases where fibre access-related works are carried out in privately owned property, Batelco is certain to retain the full ownership of any infrastructure and fibre cable deployments. The Authority therefore considers that OLOs should not be financing Batelco’s fibre access deployment, other than through the payment of the regulated MRC.

c. Fibre-access deployments are long term investments. The economic lives of fibre cables and ducts are respectively set to 20 years and 40 years in the regulatory accounts of Batelco. The Authority considers that the return on investments for access fibre deployment projects is guaranteed over such long periods, in particular when deployments are targeted at connecting business locations.

182. Furthermore, according to Batelco’s 2014 regulatory accounts, the monthly unit cost of a point-to-point fibre access is BD [X]. The Authority has estimated the present value of this monthly unit cost, which based on calculations, represents an average CAPEX figure of BD [X] (~120 times the monthly unit cost). To derive this present value, the following assumptions were made:

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17 For more information on the calculations of the unit cost of fibre access, please refer to paragraph 320 page 91.
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Annex A – Order Legal Basis and Reasoning

a. OPEX and unattributable cost contributions based on estimates from the access network bottom-up cost model;

b. weighted average lives of assets in a fibre access network deployment based on estimates from the BU access cost model; and

c. the weighted average cost of capital (i.e. regulated WACC).

183. Based on the above, the Authority considers that the current unit cost of fibre access, which is included in the cost stacks of fibre-based data connection products, is sufficient to cover the investment costs of deploying fibre access for any such reasonable deployment project in Bahrain.

184. In the following table, the Authority provides several examples of cases and specify for each example, whether Batelco should or should not recover the costs of fibre-access related works through NRCs.
Figure 14: Cases where access deployment costs may also be recovered through NRCs

<table>
<thead>
<tr>
<th>#</th>
<th>Description</th>
<th>Work required</th>
<th>Cost recovery through a NRC</th>
<th>The Authority’s justification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A large multi-storey business building (4 floors or more) is not connected with fibre.</td>
<td>Deploying a new fibre access cable (In addition, construction of new ducts and other underground infrastructure may be required in some sections).</td>
<td>No</td>
<td>Batelco should fully bear the costs of the new fibre access, as it may be used to provide services to other businesses that currently occupy or will occupy the building. The costs incurred by Batelco are however recovered through payments of MRC (which include a contribution for fibre access).</td>
</tr>
<tr>
<td>2</td>
<td>The existing fibre access cable to a business building is fully utilised by existing services and cannot accommodate any new services.</td>
<td>Deploying an additional fibre access cable to the location (In addition, construction of new ducts and other underground infrastructure may be required in some congested sections).</td>
<td>No</td>
<td>As Batelco may not have correctly anticipated future demand when it initially dimensioned the first access cable deployed at the location, Batelco should fully bear the costs of building additional fibre access capacity. The costs incurred by Batelco are however recovered through payments of MRC (which include a contribution for fibre access).</td>
</tr>
<tr>
<td>3</td>
<td>A small business building (3 floors or less) is not connected with fibre. OR A radio site is not connected with fibre.</td>
<td>Deploying a new fibre access cable (In addition, construction of new ducts and other underground infrastructure may be required in some sections).</td>
<td>Partial – Limitations apply</td>
<td>Batelco is only allowed to recover the costs incurred in building the portion of fibre access which corresponds to the path from the building (or radio site) to the nearest street/road where an existing duct is available. The costs that are recoverable exclude any additional underground infrastructure (e.g. handhole or manhole) built on the main duct path in the street/road and used to connect to the building (or radio site). In all cases, the Authority proposes to limit the recoverable portion of civil works per fibre access through a NRC to the maximum amount of BD1,000. The rest of the costs are to be recovered through payments of MRC (which include a contribution for fibre access). Payment by the OLO should be made against Batelco’s submission of an itemised invoice (broken down by time and material) and a map detailing the work performed.</td>
</tr>
<tr>
<td>#</td>
<td>Description</td>
<td>Work required</td>
<td>Cost recovery through a NRC</td>
<td>The Authority’s justification</td>
</tr>
<tr>
<td>---</td>
<td>-------------</td>
<td>----------------</td>
<td>-----------------------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>4</td>
<td>Deployment of a fibre access protection (i.e. path redundancy)</td>
<td>Deploying a redundant fibre path to a location (In addition, construction of a new duct lead-in, new ducts and other underground infrastructure may be required in some sections).</td>
<td>Yes (however, the possibility to recover costs from several parties should be investigated first)</td>
<td>Batelco is allowed to fully recover the costs incurred in deploying a new fibre protection path by charging the OLO a NRC. When protection is requested for a multi-storey building, Batelco should first propose the protection option to other existing wholesale and retail customers in the building and assess the possibility of recovering the estimated cost of work from several other parties, including its own retail division. The final amount should be split between the relevant parties based on fair and reasonable criteria. Payment by the OLO should be made against Batelco’s submission of an itemised invoice (broken down by time and material) and a map detailing the work performed.</td>
</tr>
<tr>
<td>5</td>
<td>Deployment of fibre access within privately owned property.</td>
<td>Deployment of fibre access within privately owned property (in addition to the fibre access cable, construction of new ducts and other infrastructure may be required e.g. distribution panel and boxes, fibre cables in risers etc.).</td>
<td>Yes</td>
<td>Batelco is allowed to fully recover, on a time and material basis, the costs incurred in deploying a fibre access within a privately owned property by charging the OLO a NRC. Payment by the OLO should be made against Batelco’s submission of an itemised invoice (broken down by time and material) and, if available, a map detailing the work performed.</td>
</tr>
</tbody>
</table>

Source: the Authority

185. For all the above reasons, the Authority considers that, in the majority of cases, Batelco should only recover the costs of deploying a fibre access at a specific location through the MRC of wholesale and retail access products offered at that location.

186. However, for those specific cases where the additional passive infrastructure being deployed would be of the OLO’s exclusive use in the foreseeable future (such cases are described in the above table), Batelco should, in addition to the MRC, also be allowed to recover such costs or a portion thereof through the NRC. The NRC should be capped and payment by the OLO should be made against an itemised invoice (broken down by time and material elements), and where relevant, a map detailing the work performed.

187. Batelco is invited to reflect the above limitations in the WLA and WDC service descriptions.

Q10. Do you agree with the Authority’s proposed approach aiming at limiting the payment of one-off charges for the deployment of a fibre access? Please explain and justify your position.
5.4.2 Information on coverage and availability of fibre access lines

Current situation

188. OLOs have suggested that effective competition in the markets for provision of data connection services is currently being impaired by the asymmetry of information which exists between Batelco’s retail arm and OLOs. In other words, the fact that Batelco retail can access information that OLOs cannot access means that there is not a level-playing field in this market between Batelco retail and OLOs.

189. This asymmetry of information between Batelco retail and OLOs is especially problematic when it comes to knowing the exact coverage and usage of Batelco’s access network. As a vertically integrated operator, Batelco holds a significant advantage: its enterprise business unit has access to the exact footprint of the access network\(^\text{19}\) and can thus be more responsive to any new service request from prospective customers.

190. Furthermore, Batelco’s enterprise unit can also be consulted when Batelco’s access network unit is planning fibre access extensions. The enterprise business unit can thus prospect future customers well in advance, and can then benefit from a first mover advantage.

191. For ad-hoc requests (i.e. where fibre access is not provided as part of a planned network coverage extension), Batelco’s enterprise business is also able to coordinate more efficiently with Batelco’s access network unit. They can provide an estimate of the applicable service delivery time to the customer more rapidly, and then they can ensure that the necessary work is effectively carried out according to such an estimate.

192. For the above reasons, the Authority considers that the ability for OLOs to access information on the coverage, usage and future deployment of fibre access lines is an important requirement that Batelco should meet to fulfil the access obligation under Article 57 of the Telecommunication Law.

193. The Authority is therefore of the view that:

a. Batelco should provide OLOs with online access to a database that contains information on Batelco’s access fibre network including planned deployments.

b. Until such time as this database is available, there should be an interim solution aimed at reducing the current asymmetry of information. The Authority proposes the introduction of a pre-sale process under which Batelco would inform OLOs in a timely manner of the availability or future availability of fibre access for any given location in Bahrain.

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\(^{19}\) From previous discussions with Batelco, the Authority understands that information on the coverage and usage of access lines is recorded by Batelco in its GIS system and can be consulted by a system module called “Line Plant Assignment Module”.
Introduction of a pre-sale process

194. In the series of meetings held at the end of October 2014, several OLOs explained that the only way for them to find out whether a given location is connected to Batelco’s fibre access network is to send a Service Request for a new wholesale service.

195. They stressed the importance of having a presale process by which Batelco would provide information on the availability of fibre access at a given location without having to commit through sending a Service Request.

196. Such a pre-sale process could take the form of an online database that provides details on the availability and usage of fibre access cables in Bahrain. The same database could be accessible by both OLOs and Batelco’s retail arm, thus ensuring non-discriminatory access to key information (and as such, resolving some of the issues caused by the current asymmetry of information).

197. However, the Authority is also cognisant that, while all access ducts and all fibre access cables deployed by Batelco are recorded in its Geographic Information System (“GIS”), it is not clear whether the actual usage of fibre pairs by services is being systematically updated in a centralised database. The Authority understands that, at present, Batelco has yet to develop such centralised database, which would include up-to-date information on fibre availability.

198. For the above reasons, the Authority orders the following:

   a. Batelco is required to build a centralised database on fibre access and fibre usage, with the aim of providing remote online access to such database to OLOs and its own retail business units.

   b. The type of information that would be accessed by OLOs and Batelco retail would be determined by the Authority at a later stage following consultation of relevant stakeholders. Initial discussions on the database requirements and service levels, covering accuracy, frequency of updates, information format, may be held during a meeting of the FRO.

   c. The database on fibre access and fibre usage shall be operational and accessible online by OLOs and Batelco retail not later than the 31st December 2016.

   d. Until such time as the database is made available, Batelco shall introduce a pre-sale process that would meet the following requirements:

      i. upon receiving a pre-sale request from an OLO, Batelco has a maximum of two (2) working days to indicate:

         - whether a location is already connected by a fibre cable, including any relevant information on access redundancy (e.g. business ring);
         - whether a spare fibre is or will soon be made available at such a location for the provisioning of a new service (or spare redundant fibre); and
         - in case of unavailability of fibre, an estimate of the time required to build a new fibre access.

      ii. the pre-sale process should be provided by Batelco free of charge to OLOs.
iii. the pre-sale process should be documented in Batelco's RO in an annex to the WLA and WDC service descriptions.

Q11. Do you agree with the Authority’s proposal to order Batelco to build a centralised database on fibre access and fibre usage in Bahrain? Do you agree that until such time as a database is made available, Batelco should introduce a 2-working-day presale process? Please explain and justify your position.

5.4.3 Introduction of additional speeds for the WDC product

199. The Authority considers that there is no need to introduce additional speeds for the WLA.

200. For WDC, the Authority considers that Batelco should introduce new speeds in addition to the current speeds being available for CAT/LLCO connections (i.e. DS-3, STM-1, and STM-4). The new speeds that Batelco should be offering for the WDC Connections are listed in the below table:

Figure 15: List of available speeds for the WDC Connections

<table>
<thead>
<tr>
<th>WDC Connection speeds (in Mbit/s)</th>
<th>45 Mbit/s (i.e. DS3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>156 Mbit/s (i.e. STM-1)</td>
<td>300 Mbit/s</td>
</tr>
<tr>
<td>400 Mbit/s</td>
<td>500 Mbit/s</td>
</tr>
<tr>
<td>622 Mbit/s (i.e. STM-4)</td>
<td>750 Mbit/s</td>
</tr>
<tr>
<td>1,000 Mbit/s</td>
<td>1,250 Mbit/s</td>
</tr>
<tr>
<td>1,500 Mbit/s</td>
<td>2,000 Mbit/s</td>
</tr>
<tr>
<td>2,500 Mbit/s (i.e. STM-16)</td>
<td>5,000 Mbit/s</td>
</tr>
<tr>
<td>7,500 Mbit/s</td>
<td>10,000 Mbit/s (i.e. STM-64)</td>
</tr>
</tbody>
</table>

Source: the Authority

Q12. Do you have any comments in relation to the speeds for which the WDC should be made available?
5.4.4 Aggregation Links for the WLA and WDC products

**WLA Aggregation Link**

201. The Authority is satisfied that the speed of 1Gbit/s offered by Batelco for the WLA Aggregation Link is sufficient at the moment to cater for WLA Connections.

202. The Authority will monitor the uptake of WLA Connections and would determine in the context of the next RO review if there would be some merit in considering the introduction of a 10Gbit/s WLA Aggregation Link (i.e.10 Gigabit Ethernet (“GbE”)).

203. Some OLOs have indicated that they would be interested in having the possibility to choose a higher grade CPE for the WLA Aggregation Link. Such a higher grade CPE should also include some level of redundancy, such as redundant power and processing cards.

204. For the above reason, the Authority considers that, for the WLA Aggregation Links, Batelco should allow OLOs to optionally request a higher grade CPE that includes some level of redundancy. The cost surplus of such a higher grade CPE should be borne by the OLO through the payment of a reasonable NRC.

205. The Authority therefore orders Batelco to make explicit in the WDC service description that an optional higher-grade CPE for the WLA Aggregation Link can be requested by OLOs against the payment of a reasonable NRC to cover for any cost surplus.

**WDC Aggregation Link**

206. Based on discussions held with Batelco during the presentation of the WOBS dated 9 April 2015, the Authority understands that it would be technically feasible to aggregate all existing CAT/LLCO circuits and future WDC Connections on the same CPE.

207. The Authority considers that such an Aggregation Link should be proposed for the speed 10Gbit/s (i.e. STM-64). This would allow for the efficient and cost-effective aggregation of several WDC Connections.

208. Furthermore, the Authority accepts Batelco’s proposal to offer such WDC Aggregation Link with default protection mechanisms, including:

   a. MSP 1+1 protection (with fully redundant fibre path);
   b. Sub-Network Connection Protection (SNCP); and
   c. Silver auto switching of 50ms.

209. The Authority therefore orders Batelco to make explicit in the WDC service description that:

   a. the WDC Aggregation Link(s) is/are provided for a minimum bandwidth of 10 Gbit/s;
   b. the WDC Aggregation Link(s) is/are delivered over a fully redundant fibre path;
   c. the WDC Aggregation Link(s) is/are provided with default protection mechanisms, including MSP 1+1, Sub-Network Connection Protection (SNCP), and Silver auto switching of 50ms.

210. The regulated MRC applicable to the WDC Aggregation Link is set in section 6 thereafter.
Q13. Do you have any comments in relation to the proposed technical characteristics for the WLA and WDC Aggregation Links?

5.4.5 Synchronisation feature for the WLA

211. Synchronisation is an important feature for the WLA service to be considered by OLOs for mobile backhaul transmission.

212. While the Authority is of the view that Batelco should introduce a synchronisation feature for the WLA, the Authority is also cognisant that there are various technical options associated with such feature. Furthermore, a synchronisation option for the WLA may not be necessary with the introduction of the WDC product (as WDC uses transmission technologies which are not expected to be affected by jitter).

213. As such, the Authority proposes that the different technical options for WLA synchronisation, if required, are addressed in a meeting of the FRO (see above section 4).

Q14. Would you be interested by the introduction of a synchronisation feature for the WLA? Please explain and justify you position.

5.4.6 Optional levels of protection for the WDC services

214. Batelco should propose different levels of logical and physical protections for the WDC service. In Figure 16 below, the Authority has summarized the different optional levels of protection that Batelco should make available to OLOs for WDC Connections and Aggregation Links.

215. Such optional levels of protection should at least include the following:
   a. Logical protection at the End User Premises/Point of Presence:
      i. Service, power and logical cards redundancy on CPE; or
      ii. Fully redundant CPE
   b. Logical protection at the Batelco’s ingress Service Node:
      i. Service card redundancy on the switch/router at the Service Node; or
      ii. Fully redundant Service Node (i.e. secondary Connection/Aggregation Link connected to a different Service Node than the primary Connection/Aggregation Link)
   c. Physical protection:
      i. Fibre core redundancy in the same duct path;
      ii. Duct path redundancy to the same Service Node (with or without redundant duct lead-in); or
iii. Duct path redundancy to a different Service Node (with or without redundant duct lead-in)

216. An OLO may request a full end-to-end physical path redundancy and thus may require Batelco to deliver the secondary Connection/Aggregation Link in a different lead-in duct to the building. The Authority considers that Batelco shall accommodate any such request from an OLO as long as it is reasonable. In such cases, the applicable NRC should be determined in accordance with the cost recovery limitations proposed by the Authority in section 5.4.1.
### Figure 16: Optional levels of protection for WLA and WDC Connections and Aggregation Links

<table>
<thead>
<tr>
<th>Logical protection</th>
<th>Very high level of protection</th>
<th>CPE</th>
<th>Service Node</th>
</tr>
</thead>
<tbody>
<tr>
<td>No CPE redundancy (at the End User Premises/Point of Presence)</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Service card redundancy on CPE (at the End User Premises/Point of Presence)</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Fully redundant CPE (at the End User Premises/Point of Presence)</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>No redundancy at Service Node</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Service card redundancy at Service Node</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fully redundant Service Node</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

**Single Connection/Aggregation Link (i.e. no protection)**
- X

**Primary and secondary Connection/Aggregation Link (i.e. protection)**
- X
- X
- X
- X
- X

**Physical protection**
- No redundancy
- Fibre core redundancy in the same duct path
- Duct path redundancy to the same Service Node (with or without redundant duct lead-in)
- Duct path redundancy to a different Service Node (with or without redundant duct lead-in)

Source: the Authority
217. The Authority understands that protection can be among the most important features for certain business customers in the data connection market (e.g. banking sector). In order for OLOs to compete on a level playing field with Batelco, the Authority considers that the availability of the above levels of protection shall be provided upon request for WLA and WDC Connections. Protection is also a feature that would be important for the OLOs’ own network transmission including radio site backhauling. With optional levels of protections, OLOs would be more inclined to consider WLA and WDC Connections as efficient solutions for meeting their network transmission requirements.

**Protection for WDC**

218. Full physical and logical protection for the WDC Aggregation Link will be provided by default by Batelco (see paragraph 209 above).

219. However, protection for the WDC Connections will be optional. Batelco shall therefore make it explicit in its WDC service description that optional levels of protection for WDC Connections are available for fair and reasonable additional charges.

220. When the maximum level of protection is required for a WDC Connection (i.e. full end-to-end physical path redundancy coupled with logical protection), the Authority considers that Batelco shall charge a 30% premium on top of the applicable MRC. This would ensure that Batelco recovers the cost of additional active equipment used to deliver such protection.

221. During the provisioning of a WDC Connection for which protection is required, Batelco shall provide the OLO with all the relevant technical details regarding the protection solution, including but not limited to:

   a. the service configuration;
   
   b. a detailed geographic map of the duct path used by the access fibre cable of the primary and the secondary WDC Connection (from the End User Premise or POP to Batelco’s Service Node); and
   
   c. all the relevant acceptance tests for both the primary and secondary end-to-end WDC Connections at RFS (after provisioning). The tests shall also include a simulation of the failure of the primary Connection.

222. The Authority orders Batelco to implement the provisions in paragraphs 218 to 221 in the WDC service description.

**Protection for WLA**

223. OLOs shall also have the possibility to request optional level of protection for the access network part of the WLA Connections and WLA Aggregation Links. Batelco shall therefore make explicit in its WLA service description that the optional level of protection for WLA Connections are available for fair and reasonable additional charges.

224. When the maximum level of protection is required for a WLA Connection (i.e. full end-to-end physical path redundancy coupled with logical protection), the Authority considers that Batelco shall charge a 30% premium on top of the applicable MRC. This would ensure that Batelco recovers the cost of additional active equipment used to deliver such protection.
225. When an OLO makes a request for protection, Batelco shall configure the WLA Connection with two distinct VLANs:
   a. a first VLAN for the primary end-to-end WLA Connection which will be active all the time; and
   b. a second VLAN for the secondary end-to-end WLA Connection which will be set in stand-by mode.

226. In case of failure of the primary end-to-end WLA Connection, there shall be a mechanism which ensures that data traffic is automatically switched to the secondary end-to-end WLA Connection within milliseconds when both primary and secondary end-to-end WLA Connections are delivered on the same CPE. The Authority understands that this is functionality is sometimes referred to as Ethernet Automatic Protection switching.

227. When the primary and secondary end-to-end WLA Connections are delivered on different CPEs, the secondary end-to-end WLA Connection shall be activated by Batelco upon request of the OLO in a matter of minutes.

228. During the provisioning of a WLA Connection for which protection is required, Batelco shall provide the OLO with all the relevant technical details regarding the protection solution, including but not limited to:
   a. the VLANs configuration;
   b. a detailed geographic map of the duct path used by the access fibre cable of the primary and the secondary WLA Connections (from the End User Premise or POP to Batelco’s Service Node); and
   c. all the relevant service acceptance tests for both the primary and secondary end-to-end WLA Connections at RFS (after provisioning). The tests shall also include a simulation of the failure of the primary Connection.

229. If an OLO has more than one WLA Aggregation Link and requires a WLA Connection with protection, the OLO should indicate for such WLA Connection:
   a. the WLA Aggregation Link that will be the primary Aggregation Link;
   b. the WLA Aggregation Link that will be the secondary Aggregation Link (in stand-by mode); and
   c. the capacity that should be reserved on the secondary WLA Aggregation Link. This capacity will be guaranteed in case of failure of the primary WLA Connection.

230. For the avoidance of doubt, a WLA Aggregation Link may be the primary Aggregation Link for certain WLA Connections and the secondary Aggregation Link for others.

231. The Authority orders Batelco to implement the provisions in paragraphs 223 to 230 in the WLA service description.

Q15. Do you agree that Batelco should offer as an option the full end-to-end physical and logical protection of a WLA or WDC Connection for an additional 30% mark-up on top of the applicable MRC? Please explain and justify your position.
Second ingress port on the CPE of WLA/WDC Connections and Aggregation Links

232. The Authority considers that, if required, Batelco shall allow OLOs to ingress their traffic (or their retail customer’s traffic) on a second ingress port of the CPE provided for a WLA/WDC Connection or a WLA/WDC Aggregation Link (i.e. customer facing ports).

233. The CPE can then aggregate the traffic of both ingress ports and transmit it to Batelco’s network via the same uplink port.

234. When a second port is readily available on the CPE, Batelco shall not seek to charge for this optional service.

235. The Authority orders Batelco to implement the above provision related to the use of a second ingress port on the CPE used to deliver a WLA/WDC Connection or a WLA/WDC Aggregation Link in the WLA and WDC service description respectively.

Q16. Do you agree that Batelco should allow the use of a second ingress ports on a CPE provided for a WLA/WDC Connection or a WLA/WDC Aggregation Link? Please explain and justify your position.

5.4.7 Technical information on CPEs used for WLA/WDC

236. To increase the transparency of the WLA and WDC service descriptions, the Authority considers that Batelco should provide information on the CPEs used for WLA/WDC Connections and WLA/WDC Aggregation Links in the relevant annexes of the WLA/WDC service descriptions.

237. The Authority therefore orders Batelco to include information on the CPEs used to provide WLA/WDC Aggregation Links and WLA/WDC Connections in the WLA and WDC service descriptions. Such information shall at least include for each CPE, the model name and vendor, and the default configuration (number of cards/ports etc.).

Q17. Do you agree that Batelco should provide a minimum set of information on CPEs used for WLA and WDC Aggregation Links and Connections? Please explain and justify your position.

5.4.8 QoS reporting obligation for the WLA and WDC product and services

Quarterly QoS reporting obligation

238. As all licensed operators, Batelco is subject to the Quality of Service (“QoS”) Regulation issued by the Authority on 11 September 2008 (ref: LAU/0908/21), and as such, submits quarterly QoS reports which contain information on Batelco’s QoS performance for a
range of telecommunication products and services, including retail and wholesale leased line products and services (hereafter ‘General QoS Reports’).

239. The General QoS Reports only include aggregate information on leased line products and services: it provides a high-level view of Batelco’s QoS performance for such products and services.

240. In addition to submitting General QoS Reports, Batelco also submits more detailed QoS reports on MPLS-based leased line services on a quarterly basis (hereafter ‘Detailed QoS Reports’). This reporting requirement was established by the Authority’s Decision on the Notified Controlled Tariffs 42 “NCT 42 Local MPLS” issued on 27 March 2012 (ref: MCD/03/12/047).

241. The Detailed QoS Reports provide information on Batelco’s QoS performance with regard to the wholesale service WLA, and the retail services Local MPLS and Global MPLS. Such information includes the following items:

a. the number of active connections;
b. the number of new connection delivered during the period;
c. the average actual delivery time;
d. the number of faults reported by categories;
e. the QoS parameters (i.e. MPLS core availability, latency, packet loss and Round Trip Delay);
f. the total service revenues; and
g. the number and total value of service rebates granted by Batelco during the period.

New reporting obligations

242. The Authority considers that Batelco should provide Detailed QoS Reports on a quarterly basis for WLA and WDC Connections and Aggregations Links. This information would allow the Authority to monitor the QoS performance of WLA and the WDC products.

243. The Authority also requires Batelco to provide raw information on reported WLA faults and reported WDC faults. The report should at least include:

a. the fault identification number (i.e. trouble ticket number);
b. the type of Connection and its identification number (i.e. WLA or WDC)
c. the time and date when the fault was reported;
d. the type of fault;
e. the impact of the fault on the relevant service (i.e. unavailable, partially available etc.);
f. the time and date when the connection affected by the fault was restored, i.e. trouble ticket closed);
g. the eligibility for service rebate (including justifications, if non-eligible); and
h. the amount to be rebated on the next invoice(s) (i.e. number of Service Credits), in case Penalties for Maximum Restoration Time are due.
244. At present, Batelco only reports the average and the standard deviation of QoS indicators in the Detailed QoS Reports. However, the average and the standard deviation are alone an imperfect source of information as they may hide certain phenomena (e.g. outlier results can skew the average and standard deviation). The Authority considers that the submission of raw information per fault is required to get a better understanding on the distribution of Actual Restoration Time per type of faults. This would allow the Authority to take better informed decisions in the future, should there be a need to revise the Service Level Terms and Penalties applicable to the WLA and the WDC products and services.

245. The Authority therefore orders Batelco to:

a. continue to provide on a quarterly basis Detailed QoS Reports for the Local MPLS and Global MPLS retail products and services;

b. provide on a quarterly basis Detailed QoS Reports for WLA Connections and Aggregations Links;

c. provide on a quarterly basis Detailed QoS Reports for WDC Connections and Aggregations Links;

d. provide on a quarterly basis raw information on reported WLA faults as detailed in paragraph 243 above; and

e. provide on a quarterly basis raw information on reported WDC faults as detailed in paragraph 243 above.

Publication of Detailed QoS Reports

246. In order to increase the transparency regarding the performance of Batelco’s wholesale and retail data connection products and services, the Authority reserves the right to publish on its website the above reports in their entirety or a redacted summary thereof.

Q18. Do you agree that Batelco should continue to be subject to additional QoS reporting obligations for WLA and WDC? Please explain and justify your position.
5.4.9 Technical test for the WLA and WDC

New test standard for Ethernet Connections

247. Batelco currently tests the WLA service upon its delivery according to the RFC2544 IETF test standard.\(^20\)

248. The RFC2544 test standard however is obsolete and suffers from certain drawbacks, such as:

a. QoS parameters are measured based on a sequential series of tests, instead of being measured altogether in one comprehensive test; and

b. the measurement of jitter is not supported by the RFC2544 test (i.e. frame delay variation cannot be measured).

249. As RFC2544 is not adapted to validate the performance of the WLA service against QoS Parameters, the Authority considers that Batelco should instead follow the ITU-T Y.1564 test methodology, which is defined as:

"Recommendation ITU-T Y.1564 defines a test methodology that may be used in assessing the proper configuration and performance of an Ethernet network to deliver Ethernet-based services. This out-of-service test methodology was created so that service providers may have a standard way of measuring the performance of Ethernet-based services."\(^21\)

250. The ITU Y.1564 standard thus provides a test methodology to assess the performance of end-to-end Ethernet-based services. Contrary to RFC2544, ITU Y.1564 includes the measurement of jitter (i.e. Frame Delay Variations) which is one of the QoS Parameters currently defined for the WLA service. The ITU Y.1564 standard includes the following measurements:

a. Information rate ("IR") or Bandwidth refers to the average bit rate of Ethernet service frames at the measurement point starting with the first MAC address bit and ending with the last FCS bit;

b. Frame Transfer Delay ("FTD"), also known as Round Trip Delay, is the measurement of the time delay between the transmission and the reception of a frame;

c. Frame Delay Variations ("FDV"), also known as Packet Jitter, is the measurement of the variations in the time delay between frame deliveries; and

d. Frame Loss Ratio ("FLR") is the measurement of the number of frames lost or received errors as a percentage of the total number of frames sent.


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251. For the above reasons, the Authority orders Batelco to:
   a. implement a test methodology based on the ITU Y.1564 standard when the WLA or WDC traffic handed over by the OLO to Batelco is Ethernet traffic;
   b. update the WLA and WDC service descriptions accordingly.

Submission of test results

252. At present, Batelco only provides test results upon request from the OLO. The Authority considers that test results should instead be systematically provided by Batelco to the OLO together with the RFT notice sent to the OLO. A WLA or WDC Connection should not be considered as RFT until such a time that Batelco can provide test results which meet the relevant QoS Parameters, and Acceptance Criteria (i.e. Information rate, Frame Transfer Delay [round-trip delay or latency], Frame Delay Variations [jitter], and Frame Loss Ratio).

253. In the same manner, when a Connection has been affected by a fault and has consequently been restored by a Batelco technician dispatched on site, Batelco should provide results of the tests performed on the such Connection, if any.

254. For the above reasons, the Authority orders Batelco to amend the WLA and WDC service description so that test results are systematically submitted by Batelco to OLOs:
   a. upon the provisioning of a new WLA/WDC Connection or a new WLA/WDC Aggregation Link (i.e. acceptance test). In this case, test results are to be attached to the RFT notice; and
   b. upon restoration of an existing Connection, when a test has been carried out to check that such Connection is performing according to the QoS Parameters.

Q19. Do you agree that Batelco should implement a test based on ITU-T Y.1564 test methodology and systematically provide a copy of test results to the OLO? Please explain and justify your position.

5.4.10 Access to QoS monitoring platform

255. Batelco has developed a QoS monitoring platform which enables retail and wholesale customers to monitor the performance of MPLS-based data connections against QoS Parameters. Batelco calls such Service Level monitoring platform Batelco Net View (“BNV”).

256. As clarified by Batelco in its letter dated 10 April 2014 (ref: GCL/155/14) in response to the Authority’s request for information dated 25 March 2014 (ref: MCD/03/14/019), the BNV system monitors the following parameters for connections using the MPLS transmission network:
   a. For Layer 3 retail connections (i.e. retail Layer 3 IP-VPN Local MPLS):
      i. Link availability (%);
ii. Jitter (ms);
iii. RTD (ms);
iv. Packet Loss (%);
v. Bandwidth Utilization (Mbps); and
vi. Device Performance.

b. For Layer 2 services retail and wholesale connections (i.e. retail Layer 2 Local MPLS, wholesale WLA):
i. Link availability;
ii. Bandwidth utilization; and
iii. Device performance.

257. In the same letter, Batelco specified that the BNV system is a performance monitoring tool, whose capabilities are not extended to testing procedures.

258. On 26 March 2015, Batelco confirmed by email to the Authority (ref: GCL/93/15) that all the WLA Connections at that time were being monitored by the BNV system. In addition, all the OLOs that had at least one WLA Connection at that time were able to access a web-portal version of the BNV system, and thus were able to monitor the availability, bandwidth utilization and device performance of all their WLA Connections.

259. The Authority therefore orders Batelco to:

a. provide OLOs with login and password information to access the BNV system and monitor the QoS performance of their WLA Connections;

b. include a description of the BNV system in an annex to the WLA service description. Such a description shall include user information on the BNV system (i.e. how to access, consult, and generate reports etc.).

Q20. Do you agree that OLOs should have access to Batelco’s BNV system? Should OLO’s customers (i.e. end-users) also have access to such system? Please explain and justify your position.

5.4.11 Payment of penalties for failure to meet the Maximum Restoration Time

260. The Authority notes that, while OLOs have been regularly reporting faults adversely affecting the availability of WLA Connections since the introduction of the WLA product on 28 November 2012, Batelco has not paid any service rebates to date.

261. The Authority understands that one of the main reasons that explains the lack of rebate payments lies with inherent complexity of calculating the Service Availability:
a. the calculation of Service Availability is an ad hoc manual process, which has to be performed at the end of the month; and

b. the calculation of Service Availability may be subject to several adjustments to reflect any amount of time during which the service is affected by faults falling within the remit of the OLO’s or the end-user’s responsibility and control.

262. For such reasons, the Authority considers that the application of penalties for failure to meet the Maximum Restoration Time (i.e. on a per fault basis) rather than penalties linked to the service availability is a more transparent mechanism for binding Service Levels.

263. From a process standpoint, the application of rebates for failure to meet the Maximum Restoration Time Threshold would also simplify the mechanism of calculating penalties:

a. The OLO reports a fault affecting a Connection and Batelco opens a trouble ticket;

b. Batelco troubleshoots the fault and seeks confirmation from the OLO that the Connection is now performing in accordance to the QoS Parameters;

c. Once the OLO confirms that the service is restored, Batelco closes the trouble ticket and informs the OLO whether it is eligible for Service Credits (N.B. If Batelco provides the OLO with test results proving that the Connection has been restored and now performs as per the QoS Parameters, then Batelco can directly close the trouble ticket without the OLO’s confirmation).

d. If Penalties for Restoration Time are due by Batelco, then they are directly reflected in the form of Service Credits as early as practicable, within the next two monthly invoices.

264. The above process is in line with the description of the fault management process detailed in subsection 3.2.4 above. The process allows Batelco to credit the next wholesale invoice(s) with the corresponding Service Rebate(s) without having to calculate the service availability at the end of the month – that is, the amount of rebate is to be calculated based on the Actual Restoration Time exceeding the Maximum Restoration Time.

265. For the above reasons, the Authority has decided that penalties should apply on a per fault basis for failure to meet the applicable Maximum Restoration Time defined in the WLA and WDC service description. This is in line with the framework for Service Levels proposed by the Authority (see section 3 above "Framework for defining Service Levels").

---

22 As the number of days varies in a given calendar month, the same Service Availability may represent a different Service Downtime. The Authority thus considers that a Service Level Penalty for Service Availability is less transparent than a Service Level Penalty for Restoration Time.

23 While the BNV platform enables the monitoring of MPLS-based WDC services, it only measures the technical availability of services, which is not necessarily equivalent to the Service Availability that is defined in the SLA. For instance, the fault may be due to the negligence of the Access Seeker or the end-user and, in such circumstances, Batelco should not be liable to the payment of service rebates.
Q21. Do you agree that penalties should be paid on a per fault basis for failure to meet a maximum restoration time rather than based on percentage of service availability? Explain and justify your position.

5.4.12 Service Levels applicable to the WLA and WDC products

*International benchmark of Service Levels applicable to regulated wholesale data connection products*

266. The Authority has compiled an international benchmark of SLAs applicable to regulated wholesale data connection products. This international benchmark includes four countries:24

a. UK: BT/Openreach;
b. France: Orange;
c. Belgium: Belgacom; and
d. Ireland: eircom.

267. For ease of comparison, the Service Levels currently applicable to the WLA product have also been included in the first column of the benchmark table (see Figure 17 below).

**Figure 17: Benchmark of SLAs applicable to wholesale leased line services in selected countries**

<table>
<thead>
<tr>
<th>Country</th>
<th>Bahrain</th>
<th>UK</th>
<th>France</th>
<th>Belgium</th>
<th>Ireland</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operator</td>
<td>Batelco</td>
<td>BT/Openreach</td>
<td>Orange</td>
<td>Belgacom</td>
<td>eircom</td>
</tr>
<tr>
<td>Product Name</td>
<td>Wholesale Local Access (WLA)</td>
<td>Ethernet Access Direct Service (EAD)</td>
<td>Core Ethernet LAN (CE2O)</td>
<td>Belgacom Reference Offer for Terminating Segment of Leased Line (BROTSolL) NGLL</td>
<td>Wholesale Ethernet Access (WEA)</td>
</tr>
<tr>
<td>Notes</td>
<td>Ethernet over MPLS</td>
<td>Ethernet over legacy or NGN</td>
<td>Ethernet</td>
<td>SDH-based service</td>
<td>Ethernet</td>
</tr>
</tbody>
</table>

24 The Authority notes that the benchmark is not exhaustive. Respondents are invited to provide other benchmark information as part of their submissions to the consultation.
<table>
<thead>
<tr>
<th>Country</th>
<th>Bahrain</th>
<th>UK</th>
<th>France</th>
<th>Belgium</th>
<th>Ireland</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operator</td>
<td>Batelco</td>
<td>BT/Openreach</td>
<td>Orange</td>
<td>Belgacom</td>
<td>eircom</td>
</tr>
<tr>
<td><strong>Service Request Confirmation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Key Timeframes &amp; Service Level Terms</td>
<td>Validation Time: 2 WD</td>
<td>By 17.00 hours on the next Working Day: confirm order.</td>
<td>Copper access: eligibility can be verified by consulting a database accessible through an extranet</td>
<td>Initial feedback: 2WD</td>
<td>Order Acknowledgment: 2 WD</td>
</tr>
<tr>
<td></td>
<td>5% of MRC for each working day exceeding target</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>For Order Acknowledgement</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>For speed &lt; 2 Mbit/s: €170 per target missed (max €510)</td>
</tr>
<tr>
<td><strong>Delivery Time</strong></td>
<td>Fibre available / Modification: 15 WD</td>
<td>Copper: max 14 calendar days</td>
<td>64 – 128 kbps, n x 64 kbps: 10 WD</td>
<td>For speed &lt; 2 Mbit/s: 22 WD</td>
<td>For speed &lt; 2 Mbit/s: 1/21th of the connection charge per day</td>
</tr>
<tr>
<td></td>
<td>Duct available: 30 WD</td>
<td>Fibre available: max 56 calendar days</td>
<td>n x 64 kbps, 2 Mbps: 15 WD</td>
<td>for speed ≥ 2 Mbit/s: 26 WD</td>
<td>for speed ≥ 2 Mbit/s: 1/22th of the connection charge per day</td>
</tr>
<tr>
<td></td>
<td>No duct: Exceptional Delivery Date</td>
<td>When fibre not available: to be determined by Orange</td>
<td>34 Mbps: 30 WD</td>
<td>with connection charge ranging from EUR 457 (512 kbit/s) to EUR 679 (10 Mbit/s)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>30 WD</td>
<td></td>
<td>155 Mbps: Project Based</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5% of MRC for each working day exceeding target</td>
<td>100% of monthly charge for each additional working day beyond target capped to a maximum of 60 WD (i.e. 6,000 %)</td>
<td>1 – 5 WD after RFS date: 25% of the monthly charge 6 -10 WD after RFS date: 50% of the monthly charge More than 10 WD after RFS date: 100% of the monthly charge</td>
<td></td>
<td>for speed ≥ 2 Mbit/s: 1/22th of the connection charge per day</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>with connection charge ranging from EUR 457 (512 kbit/s) to EUR 679 (10 Mbit/s)</td>
</tr>
<tr>
<td><strong>Response Time</strong></td>
<td>During working hours: 2 working hours</td>
<td>Call centre available 24/7</td>
<td>Maximum Response Time: 30 min</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Outside working hours: 4 hours</td>
<td>Acknowledgment: within 1 hour</td>
<td>Initial feedback: within 1 hour</td>
<td></td>
<td>3 working hours</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Response: within 4 hours</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Service Level Penalties</strong></td>
<td>None</td>
<td>None</td>
<td>€250 per failure to achieve maximum response time.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Service Level Terms and Service Level Penalties

### Restoration Time
- **Country**: Bahrain, UK, France, Belgium, Ireland
- **Operator**: Batelco, BT/Openreach, Orange, Belgacom, eircom

<table>
<thead>
<tr>
<th>Country</th>
<th>Bahrain</th>
<th>UK</th>
<th>France</th>
<th>Belgium</th>
<th>Ireland</th>
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</thead>
<tbody>
<tr>
<td>Operator</td>
<td>Batelco</td>
<td>BT/Openreach</td>
<td>Orange</td>
<td>Belgacom</td>
<td>eircom</td>
</tr>
<tr>
<td>Service Level Terms</td>
<td>8 hours</td>
<td>5 clock hours</td>
<td>Standard: 4 working hours</td>
<td>Premium A: 4 hours</td>
<td>Premium B: 2 hours</td>
</tr>
<tr>
<td>Disruptions impacting traffic: 4 to 5 Clock Hours (depending on speed)</td>
<td>Disruptions not impacting traffic: 3 WD</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Service Level Penalties</td>
<td>None</td>
<td>None</td>
<td>Up to 1 hour beyond target: 50% of monthly charge</td>
<td>Up to 2 hours beyond target: 100% of monthly charge</td>
<td>More than 3 hours beyond target: 300% of monthly charge</td>
</tr>
<tr>
<td>Penalty cap: 600% per year.</td>
<td>&gt; 5 working hours: 10% of the monthly subscription charge</td>
<td>&gt; 8 working hours: 15% of the monthly subscription charge</td>
<td>&gt; 24 hours: 25% of the monthly subscription charge</td>
<td>&gt; 72 working hours: 35% of the monthly subscription charge</td>
<td></td>
</tr>
</tbody>
</table>

### Availability

<table>
<thead>
<tr>
<th>Country</th>
<th>Bahrain</th>
<th>UK</th>
<th>France</th>
<th>Belgium</th>
<th>Ireland</th>
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<td>BT/Openreach</td>
<td>Orange</td>
<td>Belgacom</td>
<td>eircom</td>
</tr>
<tr>
<td>Service Level Terms</td>
<td>99.70%</td>
<td>None</td>
<td>Standard: 13 working hours per year (i.e. 99.58%)</td>
<td>Premium A: 13 hours per year (i.e. 99.58%)</td>
<td>Premium B: 3 hours (i.e. 99.97%)</td>
</tr>
<tr>
<td>Premium C: 2 hours (99.99%)</td>
<td>99.9% (on a yearly basis)</td>
<td>99.83%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Service Level Penalties</td>
<td>Penalties increasing from 5% of MRC (i.e. 99.50% &lt; SA ≤ 99.7%) to 100% of MRC (i.e. SA ≤ 75.0%)</td>
<td>None</td>
<td>Up to 2 hours beyond target: 25% of MRC</td>
<td>Up to 4 hours beyond target: 50% of MRC</td>
<td>More than 6 hours beyond target: 100% of MRC</td>
</tr>
<tr>
<td>10% of the yearly value of the service</td>
<td>50% of one MRC shall apply for each failure to achieve a minimum level of service availability in a particular quarter to a maximum of 2 MRC in any 12 month period</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: the Authority from Operators’ reference offers as of 30 November 2015

268. In setting the Service Levels applicable to the WDC product and services and revising the Service Levels applicable to the WLA product and services, the Authority has referred to the Service Levels that currently apply for similar regulated products and services in the above benchmark countries. The following section provides the Authority’s justifications for the setting of the Service Level Terms and Service Level Penalties applicable to WLA and WDC.

### Maximum Time for Service Request Acknowledgment

269. In line with the service request process proposed by the Authority (see subsection 3.2.1 above) and related definitions (see 3.3 above), the Authority sets the Maximum Time for Service Request Acknowledgment as follow:

- a. during working hours: 15 minutes following receipt of the Service Request; and
b. outside working hours: 15 minutes following the start of the first working hour after receipt of the Service Request.

270. The Authority notes that Batelco can easily meet this maximum time by setting up an automatic notice of receipt.

**Maximum Time for Service Request Confirmation**

271. In line with the service request process proposed by the Authority (see subsection 3.2.1 above) and related definitions (see 3.3 above), the Authority sets the Maximum Time for Service Request Confirmation to 2 Working Days ("WD"). Absent any formal notice from Batelco during the Maximum Time for Service Request Confirmation, the Service Request is deemed to have been accepted by Batelco.

272. The proposed 2WD are in line with the ‘Validation Time’ currently applicable to the WLA.

273. For the avoidance of doubt, an OLO may attach a presale request to the Service Request it sends to Batelco (see more detailed information on presale requests in paragraph 198.d above). In this case, Batelco shall send the OLO information on the availability of fibre access within the Maximum Time for Service Request Confirmation.

**Maximum Time for Notification of Expected RFT and RFS Dates**

274. According to the WLA service description, Batelco advises the OLO in writing of the applicable maximum lead delivery time within 7 WD from the date of the acceptance of a Service Request.

275. The Authority considers that the maximum time to provide the notice Expected RFT and RFS Dates should take into account the type of Service Request. Such notice shall be provided earlier when a Connection is already active at the location.

276. The Authority therefore sets the Maximum Time for Notification of Expected RFT and RFS Dates as follow:

   a. 2 WD for a Transfer Request, an Upgrade/Downgrade Request, a Reconfiguration Request, or a Cancellation Request; and
   b. 5 WD for a New Connection Request or a Migration Request.

277. In the case of a Cancellation Request, Batelco shall only provide the Maximum RFS Date, which shall be the expected date of cancellation, taking into account the one-month notice period required for cancellation.

**Penalties for Notification of Expected RFT and RFS Dates**

278. The Authority considers that it is important for OLO to know the Expected RFT and RFS Dates at an early stage to provide such information rapidly to their retail customers. As such, the Authority proposes to set the Penalties for Notification of Expected RFT and RFS Dates as follow:

   a. 5 Service Credits (‘SC’) for each WD after the Maximum Time for Notification of Expected RFT and RFS Dates until such time as the OLO receives the notice.
Maximum Delivery Time, Maximum Validation Time, and Penalties for RFS Date

279. In line with the service delivery process proposed by the Authority (see subsection 3.2.2 above) and related definitions (see subsection 3.3 above), the Authority sets the following Service Levels:

a. **Maximum Validation Time:** 3 WD. The Authority considers that 3 WD offers ample time for the OLO to check that the Connection is performing according to the Service Acceptance Criteria. The Maximum Validation Time applies to all types of Service Requests except for the Cancellation Request;

b. **Maximum Delivery Time:** as is currently the case for the WLA, the Authority considers that different Maximum Delivery Time Thresholds should apply to the delivery of the WLA or WDC services depending on the type of Service Request and the availability of fibre access at the location. Accordingly, the Authority set the following Maximum Delivery Time:
   i. For a Transfer Request, an Upgrade/Downgrade Request, or a Reconfiguration Request, the Maximum Delivery Time is **10 WD**;
   ii. For a New Connection Request, or a Migration Request:
      - the Maximum Delivery Time is **10 WD** when a fibre is available for a new Connection;
      - the Maximum Delivery Time is **30 WD** when a fibre is not available for a new Connection but there is sufficient duct space to pull an additional fibre access cable;
      - the Maximum Delivery Time is **60 WD** when new ducts must first be installed before deploying a new fibre access cable;
   iii. For a Cancellation Request, there is not a defined Maximum Delivery Time. The Maximum RFS Date (i.e. expected cancellation date) shall be defined to take into account the required one-month notice period for cancellation.

c. **Penalties for RFS Date:** they are set at 20 SC for failure to meet the Maximum RFS Date and 10 SC for each additional working day thereafter until the OLO receives the RFS Certificate. The Penalties for RFS Date are also subject to the provisions defined at paragraph 106 above.

280. In cases of Transfer Requests and Migration Requests, Batelco shall coordinate the deactivation and activation of the Connection on the same day to ensure minimum service disruption.

281. The above Service Levels proposed by the Authority are mostly in line with the existing WLA service level terms. However the following terms differ:

a. The concept of "Exceptional Delivery Date" that is currently applicable to the WLA disappears. The Authority proposes to define a Maximum Delivery Time of 60 WD for cases where Batelco is required to install ducts and deploy fibre access cables. The Authority considers that it is important to provide visibility on a maximum delivery time for such cases;

b. For cases where a Connection is already active, or where a fibre can accommodate a new Connection, the Maximum Delivery Time has been reduced from 15 WD to
10 WD. The Authority considers that 2 weeks provide ample time for Batelco to complete a Service Request in such cases.

c. The Maximum Delivery Time provides a upper bound limit for the setting of the Maximum RFS Date which shall include a Maximum Validation Time of 3 WD.

d. The applicable penalties for failure to complete a Service Request on time have been doubled. For the WLA, the penalties are defined as 5 SC per working day exceeding the maximum delivery date. For the WDC, the same penalties are defined as 20 SC for the first working day exceeding the Maximum RFS Date and 5 SC for each additional working day thereafter.

**Quality of Service Parameters**

282. The Authority sets the following Service Levels for the Quality of Service Parameters, applicable to services end-to-end:

a. WLA Connections ≤ 2 Mbit/s (copper-based):
   i. Round Trip Delay (Frame Transfer Delay): **20 ms**;
   ii. Jitter (Frame Delay Variations): **5 ms**; and
   iii. Frame Loss Ratio: **0.5%**

b. WLA Connections ≥ 4 Mbit/s (fibre-based):
   i. Round Trip Delay (Frame Transfer Delay): **2 ms**;
   ii. Jitter (Frame Delay Variations): **0.5 ms**; and
   iii. Frame Loss Ratio: **0.1%**

c. WDC Connections (fibre-based):
   i. Round Trip Delay (Frame Transfer Delay): **2 ms**
   ii. Jitter (Frame Delay Variations): **0 ms**; and
   iii. Frame Loss Ratio: **0%**.

283. Before setting the above QoS Parameters, the Authority has carefully considered the QoS performance reported by Batelco on a quarterly basis in the Detailed QoS Reports (see paragraph 241 above). While the QoS Parameters reported by Batelco for MPLS-based services are not measured end-to-end but at core level (i.e. from Provider Edge (“PE”) to PE), the Authority notes that:

a. the average Round Trip Delay in the core MPLS network never exceeds [X] ms;

b. the average Jitter in the core MPLS network is in the range of [X] ms to [X] ms and never exceeds 0.05 ms; and

c. the average Frame Loss Ratio in the core MPLS network never exceeds [X] %.

284. Accordingly, the Authority considers that the proposed end-to-end QoS Parameters are set at a conservative level as they leave enough margin to take into account any potential QoS deterioration that may occur in Batelco’s network. The Authority has also factored the type of access networks used by the WDC Connection as different QoS Parameters apply when delivered on copper and fibre.
285. Finally, the Authority has also had some regard to the transport technology used by WDC Connections as SDH and DWDM are not expected to be subject to jitter or frame loss.

**Fault management (i.e. Maximum Acknowledgment Time, Maximum Response Time, Maximum Restoration Time, and Penalties for Restoration Time)**

286. As explained in section 5.4.11 above, the Authority is of the view that Service Levels should no longer apply to service availability but instead to Restoration Time, on per fault basis. Penalties for Restoration Time shall be directly reflected by Batelco in the next monthly invoice(s) without the need for the OLO to claim them.

287. The Authority also considers that Batelco should be offering two levels of support with distinct Service Level Terms and Service Level Penalties:

   a. **Standard Support** which is the default support to all WLA and WDC Connections;
   b. **Premium Support** which is available for:
      i. all WLA or WDC Connections without protection, for an additional 20% premium on top of the applicable MRC; or
      ii. all WLA or WDC Connections with end-to-end physical and logical protection (see paragraphs 218 to 231 above) for no additional charge.

288. In accordance with the fault management process proposed by the Authority (see subsection 3.2.4 above) and related definitions (see 3.3 above), the Authority sets the following Service Levels:

   b. Maximum Response Time:
      i. Standard Support: 2 working hours during working hours and 4 hours outside working hours; and
      ii. Premium Support: 1 hour.
   c. Maximum Restoration Time:
      i. Standard Support: 6 hours; and
      ii. Premium Support: 2 hours.
   d. Penalties for Restoration Time:
      i. Standard Support: 10 SC for failure to meet the Maximum Restoration Time and 5 SC for each hour exceeding the Maximum Restoration Time; and
      ii. Premium Support: 20 SC for failure to meet the Maximum Restoration Time and 10 SC for each hour exceeding the Restoration Time Threshold.
   e. Maximum Monthly Penalty Cap:
      i. Standard Support: 300 SC per Connection and per month; and
      ii. Premium Support: 600 SC per Connection and per month.

289. The Authority considers that the proposed Maximum Restoration Time of respectively 6 hours and 2 hours for the Standard Support and Premium Support are reasonable and in line with the restoration time of similar regulated services offered by dominant operators in
benchmark countries. In setting the above Service Levels, the Authority has also considered the Detailed QoS Reports submitted by Batelco on a quarterly basis.

290. The proposed Penalties for Restoration Time are also considered to be fair and reasonable. They are set at a less stringent level than what is currently being offered by Openreach in the UK or Orange in France for similar regulated services. Both the UK and France are two countries with very large geographic areas, where the timely dispatch of a technician on site would likely be more challenging than it is in Bahrain.

291. Service Level Penalties for the WLA are capped at 100% of the applicable MRC on a monthly basis (see Total Monthly Rebate Cap in the WLA service description). The Authority considers that this cap is not set sufficiently high:
   a. it does not reflect the economic harm that a prolonged unavailability of service would cause to the OLO and its customer (i.e. the end-user);
   b. it does not sufficiently incentivise Batelco to proactively improve its fault management processes, thereby ensuring better quality of service.

292. The Authority also notes that the penalty cap applicable in the UK and in France far exceed one MRC (e.g. UK: 3,000%, or France: 300% per fault capped at 600% per year).

293. The Authority has therefore decided to set the Maximum Monthly Penalty Cap to 300 SC and 600 SC for Standard Support and Premium Support respectively.

**Summary of Service Levels applicable to the WLA and WDC products**

294. For ease of reference, the Authority has summarized all Service Level Terms and associated Service Level Penalties applicable to the WLA and WDC service in the following tables.
### Figure 18: Summary of the proposed Service Levels for the WLA product and services

<table>
<thead>
<tr>
<th>Service Levels</th>
<th>Service Level Terms</th>
<th>Service Level Penalties</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Service request process</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Service Request Acknowledgment | Maximum Time for Service Request Acknowledgment:  
   - During working hours: **15 minutes** following receipt of the Service Request  
   - Outside working hours: **15 minutes after the start of the first working hour following receipt of the Service Request** | |
| Service Request Confirmation | Maximum Time for Service Request Confirmation: **2 WD** | |
| **Service delivery process** | | |
| Notification of Expected RFT and RFS Dates | Maximum Time for Notification of Expected RFT and RFS Dates  
   - Transfer Request, Upgrade/Downgrade Request, Reconfiguration Request, and Cancellation Request: **2 WD**  
   - For a Cancellation Request, Batelco shall only provide the Maximum RFS Date, which shall be the expected date of cancellation, taking into account the required notice period for cancellation.  
   - New Connection Request and Migration Request: **5 WD** | Penalties for Notification of Expected RFT and RFS Dates:  
   - 5 Service Credits (‘SC’) for each WD after the Maximum Time for Notification of Expected RFT and RFS Dates until such time as the OLO receives the notice. |
| RFS Date | Maximum Delivery Time:  
   - Transfer Request, Upgrade/Downgrade Request, and Reconfiguration Request: **10 WD**  
   - New Connection Request, Migration Request:  
     - when a fibre is available for a new Connection: **10 WD**  
     - when a fibre is not available for a new Connection but there is sufficient duct space to pull an additional fibre access cable: **30 WD**  
     - when new ducts must first be installed before deploying a new fibre access cable: **60 WD**  
   - Cancellation Requests do not have a Maximum Delivery Time: the Maximum RFS Date (i.e. expected cancellation date) must be defined to take into account the one-month notice period required for cancellation.  
   - In cases of Transfer Requests and Migration Requests, Batelco shall coordinate the deactivation and activation of the Connection on the same day to ensure minimum service disruption.  
   - Maximum Validation Time: **3 WD**  
   - The Maximum Validation Time does not apply to Cancellation Request. | Penalties for RFS Date:  
   - 20 SC for failure to meet the Maximum RFS Date and 10 SC for each additional working day thereafter until the OLO receives the RFS Certificate. |
<table>
<thead>
<tr>
<th>Service Levels</th>
<th>Service Level Terms</th>
<th>Service Level Penalties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acceptance Criteria</td>
<td>For Ethernet traffic: the provisioning test shall be based on the ITU Y.1564 standard For other traffic types: to be defined by Batelco in accordance with</td>
<td></td>
</tr>
<tr>
<td>Service quality management</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QoS Parameters</td>
<td>For WLA Connections ≤ 2 Mbit/s (copper-based): - Round Trip Delay (Frame Transfer Delay): <strong>20 ms</strong> - Jitter (Frame Delay Variations): <strong>5 ms</strong> - Frame Loss Ratio: <strong>0.5%</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>For WLA Connections ≥ 4 Mbit/s (fibre-based): - Round Trip Delay (Frame Transfer Delay): <strong>2 ms</strong> - Jitter (Frame Delay Variations): <strong>0.5 ms</strong> - Frame Loss Ratio: <strong>0.1%</strong></td>
<td></td>
</tr>
<tr>
<td>Fault management process</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fault Acknowledgment Time</td>
<td>Maximum Fault Acknowledgment Time: <strong>15 min</strong></td>
<td></td>
</tr>
<tr>
<td>Response Time</td>
<td>Maximum Response Time: For Standard Support: <strong>2 working hours during working hours and 4 hours outside working hours</strong> For Premium Support: <strong>1 hour</strong></td>
<td></td>
</tr>
<tr>
<td>Restoration Time</td>
<td>Maximum Restoration Time: For Standard Support: <strong>6 hours</strong> For Premium Support: <strong>2 hours</strong></td>
<td>Penalties for Restoration Time: For Standard Support: <strong>10 SC for failure to meet the Maximum Restoration Time + 5 SC for each hour exceeding the Maximum Restoration Time</strong> For Premium Support: <strong>20 SC for failure to meet the Maximum Restoration Time and 10 SC for each hour exceeding the Maximum Restoration Time</strong> Maximum Monthly Penalty Cap: For Standard Support: <strong>300 SC per Connection and per month</strong> For Premium Support: <strong>600 per Connection and per month</strong></td>
</tr>
</tbody>
</table>
Figure 19: Summary of the proposed Service Levels for the WDC product and services

<table>
<thead>
<tr>
<th>Service Levels</th>
<th>Service Level Terms</th>
<th>Service Level Penalties</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Service request process</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Service Request Acknowledgment | Maximum Time for Service Request Acknowledgment:  
During working hours: **15 minutes** following receipt of the Service Request  
Outside working hours: **15 minutes after the start of the first working hour following receipt of the Service Request** | |
| Service Request Confirmation | Maximum Time for Service Request Confirmation: **2 WD** | |
| **Service delivery process** | | |
| Notification of Expected RFT and RFS Dates | Maximum Time for Notification of Expected RFT and RFS Dates  
Transfer Request, Upgrade/Downgrade Request, Reconfiguration Request, and Cancellation Request: **2 WD**  
For a Cancellation Request, Batelco shall only provide the Maximum RFS Date, which shall be the expected date of cancellation, taking into account the required notice period for cancellation.  
New Connection Request and Migration Request: **5 WD** | Penalties for Notification of Expected RFT and RFS Dates:  
5 Service Credits (‘SC’) for each WD after the Maximum Time for Notification of Expected RFT and RFS Dates until such time as the OLO receives the notice. |
| RFS Date | Maximum Delivery Time:  
Transfer Request, Upgrade/Downgrade Request, and Reconfiguration Request: **10 WD**  
New Connection Request, Migration Request:  
- when a fibre is available for a new Connection: **10 WD**  
- when a fibre is not available for a new Connection but there is sufficient duct space to pull an additional fibre access cable: **30 WD**  
- when new ducts must first be installed before deploying a new fibre access cable: **60WD**  
Cancellation Requests do not have a Maximum Delivery Time: the Maximum RFS Date (i.e. expected cancellation date) must be defined to take into account the one-month notice period required for cancellation.  
In cases of Transfer Requests and Migration Requests, Batelco shall coordinate the deactivation and activation of the Connection on the same day to ensure minimum service disruption.  
**Maximum Validation Time: 3 WD**  
The Maximum Validation Time does not apply to Cancellation Request. | Penalties for RFS Date:  
20 SC for failure to meet the Maximum RFS Date and 10 SC for each additional working day thereafter until the OLO receives the RFS Certificate. |
Service Levels | Service Level Terms | Service Level Penalties
--- | --- | ---
Acceptance Criteria | For Ethernet traffic: the provisioning test shall be based on the ITU Y.1564 standard. For other traffic types: to be defined by Batelco in accordance with. |  

Service quality management

QoS Parameters | For WDC Connections (fibre-based): - Round Trip Delay (Frame Transfer Delay): 2 ms - Jitter (Frame Delay Variations): 0 ms - Frame Loss Ratio: 0% |  

Fault management process

Fault Acknowledgment Time | Maximum Fault Acknowledgment Time: 15 min |  
Response Time | Maximum Response Time:  
For Standard Support: 2 working hours during working hours and 4 hours outside working hours  
For Premium Support: 1 hour |  
Restoration Time | Maximum Restoration Time:  
For Standard Support: 6 hours  
For Premium Support: 2 hours | Penalties for Restoration Time:  
For Standard Support: 10 SC for failure to meet the Maximum Restoration Time + 5 SC for each hour exceeding the Maximum Restoration Time  
For Premium Support: 20 SC for failure to meet the Maximum Restoration Time and 10 SC for each hour exceeding the Maximum Restoration Time  
Maximum Monthly Penalty Cap:  
For Standard Support: 300 SC per Connection and per month  
For Premium Support: 600 per Connection and per month

Source: the Authority

295. For the above reasons and pursuant to Articles 3(b) (1), 57(b) and 57(e) of the Telecommunication Law, and Article 4.2 of the Access Regulation, the Authority orders Batelco to:

a. adjust existing Service Levels for the WLA product and services so that they are in line with:  
   i. the Service Level Framework detailed in subsection 3.2, page 25;  
   ii. the Service Level definitions detailed in subsection 3.3, page 42;  
   iii. the Service Level Terms and Penalties detailed in Figure 18 above, including the introduction of a Standard Support and a Premium Support;

b. include a summary table of the Service Level Terms and Penalties in the WLA service description in the format detailed in subsection 0, page 47 (see Figure 18 above);
c. implement Service Levels for the WDC product and services in line with:
   i. the Service Level Framework detailed in subsection 3.2, page 25;
   ii. the Service Level definitions detailed in subsection 3.3, page 42;
   iii. the Service Level Terms and Penalties detailed in above, including the introduction of a Standard Support and a Premium Support; and

d. include a summary table of the Service Level Terms and Penalties in the WDC service description in the format detailed in subsection 0, page 47 (see Figure 19 above).

Q22. Do you agree with the Authority's proposed introduction of a ‘Premium Support’ service for an additional 20% premium on top of the applicable MRC? Please explain and justify your position.

Q23. Do you agree with the Authority's proposed Service Level Terms and Penalties for the WLA and WDC products and services. Please explain and justify your position.

SUMMARY OF SUBMISSIONS ON SECTION 5

296. In this subsection, the Authority will add a summary of the submissions and cross-submissions (if any) received from stakeholders on section 5 (Review of non-price terms applicable to wholesale data connectivity products and services).

THE AUTHORITY’S FINAL CONCLUSIONS ON SECTION 5

297. In this subsection, the Authority will provide its final views and conclusions with regard to section 5 (Review of non-price terms applicable to wholesale data connectivity products and services).
6 Review of the price terms applicable to the WLA and WDC products and services

298. In the following section, the Authority reviews the price terms applicable to the WLA and WDC products and services.

CONSULTATION TEXT

6.1 Batelco’s proposed charges for the WLA, the CAT and the LLCO connections

6.1.1 Batelco’s proposed charges for the WLA Connections

299. As part of the cover letter included in its RO submission dated 16 October 2014, Batelco proposes to freeze the current charges applicable to the WLA Connections.

300. To justify such a price freeze, Batelco highlights that there has been a shift in costs in 2012 which resulted in significantly increased prices for the lower throughputs delivered on copper (i.e. 2Mbit/s and below) compared with the higher throughputs delivered on fibre (i.e. 4Mbit/s and above). Batelco also submits that 70% of existing customers are subscribed to lower speeds. By proposing to freeze the charges, Batelco hopes to minimize any adverse impact that may be experienced in the majority of the market.

301. While Batelco proposes to freeze the WLA charges, Batelco also provides the cost-stack of the WLA based on the 2012 regulatory accounts (see Figure 20 below).

302. The Authority notes that the WLA charges calculated by Batelco based on 2012 regulatory costs are:

a. higher than current charges for speeds lower or equal to 1Mbit/s (from +41% for 64 kbit/s to +2% for 1Mbit/s); and
b. lower than current charges for speeds higher or equal to 2Mbit/s (from -16% for 2Mbit/s to -55% for 1Gbit/s).
Draft Order on the Reference Offer of Batelco  
Annex A – Order Legal Basis and Reasoning

Figure 20: Cost stack submitted by Batelco for the WA service

<table>
<thead>
<tr>
<th>Chargeable item</th>
<th>CPE</th>
<th>Fibre/Copper cost</th>
<th>MSAN G.SHDSL</th>
<th>Aggregation – distribution (CN19, CN21, CN23, CN40, CN56)</th>
<th>MSAN (CN08)</th>
<th>Core (CN38) Core – Core Link (CN31)</th>
<th>Retail activities Costs</th>
<th>Other Wholesale activities</th>
<th>Total cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>64kbit/s</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>82.601</td>
</tr>
<tr>
<td>128kbit/s</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>83.750</td>
</tr>
<tr>
<td>256kbit/s</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>86.047</td>
</tr>
<tr>
<td>512kbit/s</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>90.642</td>
</tr>
<tr>
<td>1Mbit/s</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>99.400</td>
</tr>
<tr>
<td>2Mbit/s</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>117.348</td>
</tr>
<tr>
<td>4Mbit/s</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>209.136</td>
</tr>
<tr>
<td>8Mbit/s</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>246.012</td>
</tr>
<tr>
<td>10Mbit/s</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>261.996</td>
</tr>
<tr>
<td>15Mbit/s</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>297.686</td>
</tr>
<tr>
<td>20Mbit/s</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>329.921</td>
</tr>
<tr>
<td>25Mbit/s</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>359.364</td>
</tr>
<tr>
<td>50Mbit/s</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>484.484</td>
</tr>
<tr>
<td>75Mbit/s</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>589.428</td>
</tr>
<tr>
<td>100Mbit/s</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>683.099</td>
</tr>
<tr>
<td>150Mbit/s</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>849.687</td>
</tr>
<tr>
<td>200Mbit/s</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>998.381</td>
</tr>
<tr>
<td>300Mbit/s</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>1,262.824</td>
</tr>
<tr>
<td>400Mbit/s</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>1,498.860</td>
</tr>
<tr>
<td>500Mbit/s</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>1,715.797</td>
</tr>
<tr>
<td>1,000Mbit/s</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>2,637.687</td>
</tr>
</tbody>
</table>

* It appears that Batelco has omitted to include the cost of fibre access for the WLA Aggregation Link. This has been corrected by the Authority in the above table.

Source: Batelco’s RO submission dated 16 October 2014, 2012 WLA Cost Stacks.xlsx
6.1.2 Batelco's proposed charges for the high-speed CAT/LLCO connections

303. Batelco no longer offers new TDM-based low-speed CAT/LLCO services to OLOs. However Batelco continues to support all existing low-speed TDM-based connections but intends to gradually migrate such legacy connections to its Next Generation Network ("NGN") (i.e. Ethernet over MPLS). As such, Batelco does not provide any cost stack for TDM-based low speed CAT/LLCO connections but indicates that the applicable charges will be those of NGN-based connections.

304. As part of its RO Submission, Batelco submitted the following cost stack for the high-speed CAT/LLCO services.

Figure 21: Cost stack submitted by Batelco for the high-speed CAT/LLCO service

<table>
<thead>
<tr>
<th>speed</th>
<th>WS Factor</th>
<th>Wholesale Activities Cost</th>
<th>Access Fibre Cost for 2 ends</th>
<th>Equipment Cost for two ends</th>
<th>Network Cost</th>
<th>Total cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>DS3</td>
<td>[x]</td>
<td>[x]</td>
<td>[x]</td>
<td>[x]</td>
<td>[x]</td>
<td>3,410</td>
</tr>
<tr>
<td>STM-1</td>
<td>[x]</td>
<td>[x]</td>
<td>[x]</td>
<td>[x]</td>
<td>[x]</td>
<td>5,307</td>
</tr>
<tr>
<td>STM-4</td>
<td>[x]</td>
<td>[x]</td>
<td>[x]</td>
<td>[x]</td>
<td>[x]</td>
<td>13,695</td>
</tr>
</tbody>
</table>

Source: Batelco’s RO submission dated 16 October 2014, 2012 Based High Speed CAT and LLCO Cost Stacks.xlsx

305. However, Batelco proposes to maintain the same price ceilings for high-speed CAT/LLCO connections that were ordered by the Authority in the RO order dated 14 May 2012.

306. Batelco also expresses the wish to withdraw the high-speed CAT/LLCO connections from the RO "on the basis that the relevant market is already effectively competitive".25

6.1.3 Batelco’s proposed charges for the WOBS

307. Batelco submitted the cost stack of the proposed WOBS service for the Authority’s review on 29 April 2015 (see below table).

---

25 Batelco’s cover letter for the RO submission dated 16 October 2014 (ref: GCL/389/14)
308. The transmission costs of the WOBS have been derived by Batelco based on the weighted-gradient unit cost of its SDH transmission network.

309. The Authority observes that the total costs of the WOBS do not correspond to the prices proposed by Batelco as part of the WOBS service description submitted on 9 April 2015 (see Batelco proposed prices in Figure 13 on page 61).

### 6.2 The Authority’s review of the WLA and WDC cost stacks

310. In the following sections, the Authority reviews the key components of the WDC cost stacks. As discussed in the above sections, the WDC product would be available in two variants:

   a. WLA; and
   b. WDC

311. Some of the cost components are common to both technical variants of the WDC, while others are specific to the transmission technology used. The following section details the Authority’s review of each cost component involved in the provision of WDC Connections and associated services.

#### 6.2.1 CPE costs

**CPEs for WLA Connections**

312. The Authority has not made any adjustment to the costs that Batelco seeks to recover for the CPEs used at the end-point of WLA Connections (ex-WLA Connections).

**CPEs for WDC Connections**

313. The Authority has reviewed the costs that Batelco wishes to recover from the WDC Connections.

---

**Figure 22: Cost stack submitted by Batelco for the proposed WOBS**

<table>
<thead>
<tr>
<th>Speed</th>
<th>WS Factor</th>
<th>Wholesale Activities Cost</th>
<th>Access Fibre Cost</th>
<th>Equipment Cost for 2 ends ( one in access &amp; one in Hub site )</th>
<th>Network (transmission) Cost</th>
<th>Total cost / prices</th>
</tr>
</thead>
<tbody>
<tr>
<td>300 Mbit/s</td>
<td>[x]</td>
<td>[x]</td>
<td>[x]</td>
<td>[x]</td>
<td>[x]</td>
<td>2,990</td>
</tr>
<tr>
<td>500 Mbit/s</td>
<td>[x]</td>
<td>[x]</td>
<td>[x]</td>
<td>[x]</td>
<td>[x]</td>
<td>3,376</td>
</tr>
<tr>
<td>1,000 Mbit/s</td>
<td>[x]</td>
<td>[x]</td>
<td>[x]</td>
<td>[x]</td>
<td>[x]</td>
<td>4,160</td>
</tr>
<tr>
<td>2,500 Mbit/s</td>
<td>[x]</td>
<td>[x]</td>
<td>[x]</td>
<td>[x]</td>
<td>[x]</td>
<td>5,945</td>
</tr>
<tr>
<td>10,000 Mbit/s</td>
<td>[x]</td>
<td>[x]</td>
<td>[x]</td>
<td>[x]</td>
<td>[x]</td>
<td>11,878</td>
</tr>
</tbody>
</table>

Source: Batelco’s submission dated 29 April 2015 (ref: GCL/119/15), Wireless backhaul costing 2012 based.xlsx
314. In an email dated 2 April 2015, Batelco provided price information on some of the CPEs it uses in its network operations. Such CPEs support both SDH and DWDM technologies. They are scalable and their prices vary with the number cards that are installed in the equipment slots for the uplinks and downlinks. However, as part of its email, Batelco did not provide a breakdown of prices sufficiently detailed for the different service cards and processing/memory cards used for such CPEs. Batelco appeared to have instead provided CPE prices for their maximum configuration.

315. Absent detailed and updated information on CPEs that are compatible with both SDH and DWDM technologies, the Authority has used price information provided by Batelco in the context of the core network BU cost model project.

316. The Authority has also made several assumptions to derive a monthly cost of SDH CPEs. Such assumptions are detailed in the below table.

**Figure 23: Assumptions taken by the Authority to derive a monthly cost for SDH CPEs**

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asset lives of SDH CPEs (in years)</td>
<td>5</td>
<td>While SDH equipment has an asset life of 10 years in the regulatory accounts when it is used by Batelco for core network transmission purposes, the Authority considers that an asset life of 5 years is more appropriate when the SDH equipment is used as CPE for customers.</td>
</tr>
<tr>
<td>Average NBV/GBV ratio</td>
<td>50%</td>
<td>This ratio corresponds to the average life of the equipment over its life span i.e. 2.5 years. This ratio is used to derive the average capital employed and thus the average return on such capital employed.</td>
</tr>
<tr>
<td>Weighted Average Cost of Capital (&quot;WACC&quot;)</td>
<td>9.50%</td>
<td>As per the Cost of Capital Determination issued on 20 February 2013 (ref: MCD 02/13/018)</td>
</tr>
<tr>
<td>Maintenance (% of CAPEX)</td>
<td>10%</td>
<td>The Authority considers that the level of CPE maintenance set at 10% of equipment price is reasonable and in line with international benchmark.</td>
</tr>
<tr>
<td>Un- attributable costs (% of depreciation and maintenance OPEX)</td>
<td>[X]%</td>
<td>Un-attributable costs are common costs (i.e. overhead). They represent [X]% of total costs in Batelco's 2012 regulatory accounts. The percentage uplift is therefore calculated as follow: [X]% = 1/(1-[X]%)-1</td>
</tr>
</tbody>
</table>

Source: the Authority

317. Based on the above assumptions, and based on price information provided by Batelco in the context of the core network BU model project, the Authority has calculated the monthly cost of the CPEs compatible with SDH and DWDM technologies. Details of the calculations are reproduced in the following table:
Figure 24: The Authority’s calculations SDH CPEs monthly cost

<table>
<thead>
<tr>
<th></th>
<th>DS3 / STM-1</th>
<th>STM-4</th>
<th>STM-16</th>
<th>STM-64</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rack</td>
<td>[x]</td>
<td>[x]</td>
<td>[x]</td>
<td>[x]</td>
</tr>
<tr>
<td>Subrack OSN 1500</td>
<td>[x]</td>
<td>[x]</td>
<td>[x]</td>
<td>[x]</td>
</tr>
<tr>
<td>Subrack OSN 3500</td>
<td>[x]</td>
<td>[x]</td>
<td>[x]</td>
<td>[x]</td>
</tr>
<tr>
<td>Optical Interface Board 12xSTM1 *</td>
<td>[x] *</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Optical Interface Board 4xSTM4</td>
<td>[x]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Optical Interface Board 4xSTM-16</td>
<td>[x]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Optical Interface Board 2xSTM-64</td>
<td>[x]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total CAPEX</td>
<td>[x]</td>
<td>[x]</td>
<td>[x]</td>
<td>[x]</td>
</tr>
<tr>
<td>Depreciation</td>
<td>[x]</td>
<td>[x]</td>
<td>[x]</td>
<td>[x]</td>
</tr>
<tr>
<td>Return on capital employed (i.e. WACC)</td>
<td>[x]</td>
<td>[x]</td>
<td>[x]</td>
<td>[x]</td>
</tr>
<tr>
<td>Maintenance</td>
<td>[x]</td>
<td>[x]</td>
<td>[x]</td>
<td>[x]</td>
</tr>
<tr>
<td>Un-attributable costs</td>
<td>[x]</td>
<td>[x]</td>
<td>[x]</td>
<td>[x]</td>
</tr>
<tr>
<td>Total annual cost</td>
<td>[x]</td>
<td>[x]</td>
<td>[x]</td>
<td>[x]</td>
</tr>
<tr>
<td>Total monthly cost</td>
<td>[x]</td>
<td>[x]</td>
<td>[x]</td>
<td>[x]</td>
</tr>
</tbody>
</table>

Note: the 2010 prices of equipment have been adjusted for the year 2015 based on an annual price trend of -5%.

* The Authority does not have any price information for optical interface boards of lesser capacity than 12 STM-1. As a proxy for the price of an optical board of lesser capacity, the Authority has made a downward adjustment of -33% to the price of the optical interface board 12xSTM1. Absent information, the Authority considers such adjustment to be reasonable given price changes between optical interface boards of different capacity (e.g. STM-4 and STM-16).

Source: the Authority

6.2.2 Copper access costs and MSAN costs

318. The low-speed WLA Connections are to be delivered by a copper line. As such, they are to use Batelco’s access copper network and Multi-Service Access Node ("MSAN") which correspond to the following network elements in Batelco’s regulatory accounts:

- copper access (i.e. network element AN01)
- MSAN G.SHDSL access card (i.e. network element AN20); and
- MSAN common data card (i.e. network element CN08).

319. Based on Batelco’s 2014 regulatory accounts and 2014 operational data, the Authority has calculated the 2014 unit cost of the above network elements. Details of the calculations are presented in the below table.
### Figure 25: 2014 monthly unit costs of network elements AN01, AN20 and CN08

<table>
<thead>
<tr>
<th>Network Element</th>
<th>2014 Total Cost</th>
<th>Average Number of Units in 2014</th>
<th>Monthly Unit Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access Copper (AN01)</td>
<td>BD [x]</td>
<td>[x] copper accesses</td>
<td>BD [x] per copper access</td>
</tr>
<tr>
<td>MSAN G.SHDSL access card (AN20)</td>
<td>BD [x]</td>
<td>[x] G.SHDSL cards</td>
<td>BD [x] per G.SHDSL card</td>
</tr>
<tr>
<td>MSAN Common Card Data (CN08)</td>
<td>BD [x]</td>
<td>[x] Mbit/s (average allocated bandwidth at MSAN)</td>
<td>BD [x] per Mbit/s of bandwidth allocated at MSAN</td>
</tr>
</tbody>
</table>

Source: the Authority, based on Batelco's 2014 regulatory accounts

### 6.2.3 Fibre access costs

320. According to Batelco’s 2014 regulatory accounts, the total cost allocated to fibre access (i.e. network element AN08) is BD [x] for a total average of [x] fibre accesses used for fixed data connections in 2014. The resulting monthly unit cost is BD [x] per fibre access in 2014 (i.e. BD [x] = BD [x] / [x] accesses / [x] months).

### 6.2.4 MPLS transmission costs

321. In Batelco’s regulatory accounts, the cost of MPLS transmission is recorded under the following network elements (in order, from aggregation to core elements):

- a. CN23 [MSAN – Aggregation Link (Data)];
- b. CN40 [MPLS Aggregation (Data)];
- c. CN21 [Aggregation – Distribution Link (Data)];
- d. CN56 [MPLS Distribution Routers (Data)];
- e. CN19 [Distribution – Core Link (Data)];
- f. CN38 [MPLS Core Data]; and
- g. CN31 [Core – Core Link (Data)].

322. In order to derive a forward-looking cost of MPLS transmission for 2016, the Authority has updated the core network BU cost model with the latest information on the number of services using the MPLS transmission network (i.e. based on 2011, 2012, 2013 and 2014 routing factor tables, annual market indicators, and the QoS reports for Local MPLS, Global MPLS and WLA services submitted by Batelco on a quarterly basis).

323. The Authority has then run the BU model for the years 2011 to 2016 to derive a trend for the unit cost of MPLS transmission for the period. The resulting trend was compared with Batelco’s top-down figures which are available up to 2014 (see below figure).
Figure 26: Top-down unit cost and bottom-up unit cost of MPLS transmission (2010 base 100)

<table>
<thead>
<tr>
<th>Year</th>
<th>Top down unit cost index (2010 base 100)</th>
<th>Top down annual percentage change</th>
<th>Bottom-up unit cost index (2010 base 100)</th>
<th>Bottom-up annual percentage change</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>100</td>
<td>-12%</td>
<td>100</td>
<td>-27%</td>
</tr>
<tr>
<td>2011</td>
<td>76</td>
<td>-24%</td>
<td>73</td>
<td>-29%</td>
</tr>
<tr>
<td>2012</td>
<td>50</td>
<td>-33%</td>
<td>52</td>
<td>-24%</td>
</tr>
<tr>
<td>2013</td>
<td>42 *</td>
<td>-17%</td>
<td>40</td>
<td>-30%</td>
</tr>
<tr>
<td>2014</td>
<td>32 *</td>
<td>-23%</td>
<td>28</td>
<td>-11%</td>
</tr>
<tr>
<td>2015</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>2016</td>
<td>n/a</td>
<td>n/a</td>
<td>19</td>
<td>-24%</td>
</tr>
</tbody>
</table>

* The 2013 and 2014 MPLS unit costs were calculated by the Authority based on Batelco’s 2013 and 2014 regulatory accounts.

Source: the Authority based on Batelco’s 2010 to 2014 regulatory accounts and the results of the BU model.

324. The Authority notes that the BU model provides a good estimate of the actual rate of decrease of the unit cost of MPLS transmission between 2010 and 2014:
   a. based on Batelco’s regulatory accounts (i.e. top down costs), the unit cost of MPLS transmission has decreased on average by -25% per year between 2010 and 2014.
   b. for the same period, the BU model provide an estimate of -27% per year.

325. The model estimates that the unit cost of MPLS transmission will decline by a further -33% between 2014 and 2016.

326. To ensure that regulated charges are set based on forward-looking costs, the Authority has decided to apply a downward adjustment of -20% to the 2014 unit cost of MPLS transmission (as calculated from Batelco’s 2014 regulatory accounts). While this adjustment is more conservative than the trend anticipated by the BU model, the Authority considers that it provides a fair and reasonable estimate of the unit cost of MPLS transmission for 2016.
6.2.5 SDH and DWDM transmission costs

327. In Batelco’s 2012 regulatory accounts, the cost of SDH and DWDM transmission is recorded under the following network elements:

   a. CN50 [Transmission DWDM];
   b. CN51 [UMG – ISDN Link];
   c. CN52 [Transmission SDH Data];
   d. CN53 [Transmission ASCOM Data];
   e. CN54 [Transmission BDDN Data]; and
   f. CN55 [Transmission- Interconnect Operators].

328. To derive the unit cost of SDH and DWDM transmissions, Batelco sums up the costs of all the above network elements and divides the total by the number of weighted equivalent E1 circuits. As Batelco’s DWDM network is used, among other purposes, to offload traffic from its SDH network, it is therefore appropriate to derive an average cost of SDH/DWDM transmission.

329. The costs of the different transmission systems in terms of E1 circuits is obtained using the following conversion factors:

   a. E1 = 1 weighted equivalent E1 circuit;
   b. DS3 = 8.62 weighted equivalent E1 circuits;
   c. STM-1 = 23.04 weighted equivalent E1 circuits;
   d. STM-4 = 42.37 weighted equivalent E1 circuits; and
   e. STM-16 = 118.95 weighted equivalent E1 circuits.

330. Using the same approach as followed for MPLS transmission (see above paragraphs 322 and 323), the Authority has derived a 'bottom-up' trend for the unit cost of SDH/DWDM transmission during the period 2010-2016. The trend was compared with top-down figures, which are available up to 2014 (see below figure).
Figure 27: Top-down unit cost and bottom-up unit cost of SDH/DWDM transmission (2010 base 100)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Top down unit cost index (2010 base 100)</td>
<td>100</td>
<td>105</td>
<td>108</td>
<td>87 *</td>
<td>70 *</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Top down annual percentage change</td>
<td>5%</td>
<td>2%</td>
<td>-19%</td>
<td>-20%</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Bottom-up unit cost index (2010 base 100)</td>
<td>100</td>
<td>88</td>
<td>90</td>
<td>80</td>
<td>75</td>
<td>62</td>
<td>58</td>
</tr>
<tr>
<td>Bottom-up annual percentage change</td>
<td>-12%</td>
<td>2%</td>
<td>-10%</td>
<td>-7%</td>
<td>-17%</td>
<td>-7%</td>
<td></td>
</tr>
</tbody>
</table>

* The 2013 and 2014 SDH/DWDM unit costs were calculated by the Authority based on Batelco’s 2013 and 2014 regulatory accounts.

Source: the Authority based on Batelco’s 2010, 2011 and 2012 regulatory accounts and the results of the BU model.

331. It is worth noting that the BU model provides a good estimate of the decrease in unit cost of SDH/DWDM transmission between 2010 and 2014. The actual decrease of the unit cost was -30% between 2010 and 2014, when the bottom-up provides an estimate decrease of -25% for the same period.

332. The Authority also notes that the unit cost of SDH/DWDM transmission has increased between 2010 and 2012. According to the Authority’s analysis, this is mainly due to two factors:
   a. Batelco’s investment in DWDM network equipment during the period; and
   b. a slight decrease of total traffic between 2011 and 2012.
333. The model estimates that the unit cost of SDH/DWDM transmission will decline by a further -23% between 2014 and 2016.

334. To ensure that regulated charges are set based on forward-looking costs, the Authority has decided to apply a downward adjustment of -15% to the 2014 unit cost of SDH/DWDM transmission (as calculated from Batelco’s 2014 regulatory accounts). While this adjustment is more conservative than the trend anticipated by the BU model, the Authority considers that it provides a fair and reasonable estimate of the unit cost of SDH/DWDM transmission for 2016.

6.2.6 Non-network costs

335. Prior to the launch of the WLA, the Authority considered that there was no top-down cost information available on which to base a regulatory pricing decision (i.e. to determine the portion of non-network cost that Batelco would be allowed to recover through the WLA charges). The Authority thus used the retail costs incurred by Batelco for the provision of the Local MPLS service as a proxy of the wholesale costs that Batelco would likely incur for the provision of the WLA service. However, the Authority considers that the approach that was followed at the time may have led to over-estimate the actual costs that are incurred for providing equivalent services at the wholesale level. This is because it is very unlikely that Batelco would incur the same amount of non-network costs per wholesale connection (WLA service) as it does for each retail connection (Local MPLS service). To support such views, the Authority highlights that the non-network costs of the Local MPLS service includes the following cost categories:

a. **Marketing and communication costs** (i.e. RA41 and RA24): the marketing and communication costs account for [X]% of the total non-network costs that Batelco incurred for the Local MPLS service in 2012. As Batelco does not incur any marketing and communication costs for the provision of the WDC service, such costs are not relevant for the WDC service;

b. **Sales support and management costs** (i.e. RA18, RA19, RA20, RA22, RA43, RA44, and RA49): the sales support and management costs represent [X]% of the total non-network costs in 2012. The technical staff of OLOs are unlikely to require the same ad-hoc and sales support as retail customers would. Furthermore, the WDC is a standard and well-defined service, and Batelco only has a few OLOs as customers for the WDC service compared to the relatively high number of distinct customers at the retail level. The Authority therefore considers that a great majority of sales support and management costs would not be required at the wholesale level.

c. **Credit control collection and trade debtors** (i.e. RA16, RA55): such costs represent [X]% of the total non-network costs in 2012 ([X]% of total costs for the “Trade

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26 The WLA was launched by Batelco on 27 November 2012.
debtors’ account [RA55] alone). It is not clear to the Authority whether the whole amount of such retail costs would also be relevant at the wholesale level.

337. The above cost categories account for [X]% of the total non-network costs allocated to the Local MPLS service. The Authority considers that a great portion of such costs are not relevant to the costs incurred by Batelco for the provision of WLA and WDC Connections.

338. To review the wholesale cost component of the WLA and WDC cost stacks, the Authority has followed the approach detailed in Figure 28 below:

a. the Authority has first derived gradients for the allocation of such wholesale costs to data connectivity services that would meet the following criteria:
   i. unlike network costs, the non-network cost allocated for each service should not be strongly correlated with the speed of such a service;
   ii. the wholesale costs allocated to each WLA or WDC Connection should follow a similar progression with regard to speed to that of the Local MPLS service (see column A); and

b. based on the above criteria, the Authority proposes the following gradients (see column C):
   i. For all speeds ≤ 2 Mbit/s: gradient = 1
   ii. For all speed ≥ 4 Mbit/s: gradient = \left( \frac{\text{speed in Mbit/s}}{2} \right)^{1/4}

c. the Authority has considered the total amount of wholesale costs that Batelco is seeking to recover for the CAT and LLCO services in 2012;

d. according to the proposed gradients, the Authority has derived a unit cost per gradient-weighted wholesale service of BD [X] (see column G). This unit cost was calculated by dividing the total amount of wholesale costs in 2012 (i.e. BD [X]) by the total gradient-weighted average number of circuits in 2012 (i.e. [X], see total of column F).

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27 This wholesale cost amount was BD 167,635 in 2012, see cell B42, sheet “BB CAT & LLCO Summary Cost 2012”, file “2012 Based High Speed CAT and LLCO Cost Stacks.xlsx”, Batelco’s RO submission based on 2012 regulatory accounts.
Figure 28: Approach followed by the Authority to derive a gradient-based allocation of non-network costs to wholesale data connections

<table>
<thead>
<tr>
<th>Speed</th>
<th>A) Non-network costs allocated to Local MPLS Layer 2 service in 2012</th>
<th>B) Non-network costs allocated to Local MPLS service in 2012 (normalized at 2 Mbit/s = 1)</th>
<th>C) Proposed formula-based gradients by the Authority</th>
<th>D) Column C expressed as a percentage of column B</th>
<th>E) Average number of CAT/LLCO circuits in 2012 (i.e. column C × column E)</th>
<th>F) Gradient-weighted average number of CAT/LLCO circuits in 2012 (i.e. column C × column E)</th>
<th>G) Monthly wholesale cost per circuit</th>
<th>H) Total annual wholesale cost (i.e. column E × column G × 12)</th>
</tr>
</thead>
<tbody>
<tr>
<td>264 Kbps</td>
<td>BD [x]</td>
<td>1.00</td>
<td>1.00</td>
<td>100%</td>
<td>BD [x]</td>
<td>BD [x]</td>
<td>BD [x]</td>
<td>BD [x]</td>
</tr>
<tr>
<td>128 Kbps</td>
<td>BD [x]</td>
<td>1.00</td>
<td>1.00</td>
<td>100%</td>
<td>BD [x]</td>
<td>BD [x]</td>
<td>BD [x]</td>
<td>BD [x]</td>
</tr>
<tr>
<td>256 Kbps</td>
<td>BD [x]</td>
<td>1.00</td>
<td>1.00</td>
<td>100%</td>
<td>BD [x]</td>
<td>BD [x]</td>
<td>BD [x]</td>
<td>BD [x]</td>
</tr>
<tr>
<td>384 Kbps</td>
<td>BD [x]</td>
<td>1.00</td>
<td>1.00</td>
<td>100%</td>
<td>BD [x]</td>
<td>BD [x]</td>
<td>BD [x]</td>
<td>BD [x]</td>
</tr>
<tr>
<td>512 Kbps</td>
<td>BD [x]</td>
<td>1.00</td>
<td>1.00</td>
<td>100%</td>
<td>BD [x]</td>
<td>BD [x]</td>
<td>BD [x]</td>
<td>BD [x]</td>
</tr>
<tr>
<td>1 Kbps</td>
<td>BD [x]</td>
<td>1.00</td>
<td>1.00</td>
<td>100%</td>
<td>BD [x]</td>
<td>BD [x]</td>
<td>BD [x]</td>
<td>BD [x]</td>
</tr>
<tr>
<td>2 Kbps</td>
<td>BD [x]</td>
<td>1.00</td>
<td>1.00</td>
<td>100%</td>
<td>BD [x]</td>
<td>BD [x]</td>
<td>BD [x]</td>
<td>BD [x]</td>
</tr>
<tr>
<td>8 Mbps</td>
<td>BD [x]</td>
<td>1.19</td>
<td>[x]</td>
<td>[x]</td>
<td>BD [x]</td>
<td>BD [x]</td>
<td>BD [x]</td>
<td>BD [x]</td>
</tr>
<tr>
<td>10 Mbps</td>
<td>BD [x]</td>
<td>1.41</td>
<td>[x]</td>
<td>[x]</td>
<td>BD [x]</td>
<td>BD [x]</td>
<td>BD [x]</td>
<td>BD [x]</td>
</tr>
<tr>
<td>15 Mbps</td>
<td>BD [x]</td>
<td>1.50</td>
<td>[x]</td>
<td>[x]</td>
<td>BD [x]</td>
<td>BD [x]</td>
<td>BD [x]</td>
<td>BD [x]</td>
</tr>
<tr>
<td>20 Mbps</td>
<td>BD [x]</td>
<td>1.65</td>
<td>[x]</td>
<td>[x]</td>
<td>BD [x]</td>
<td>BD [x]</td>
<td>BD [x]</td>
<td>BD [x]</td>
</tr>
<tr>
<td>25 Mbps</td>
<td>BD [x]</td>
<td>1.78</td>
<td>[x]</td>
<td>[x]</td>
<td>BD [x]</td>
<td>BD [x]</td>
<td>BD [x]</td>
<td>BD [x]</td>
</tr>
<tr>
<td>30 Mbps</td>
<td>BD [x]</td>
<td>1.88</td>
<td>[x]</td>
<td>[x]</td>
<td>BD [x]</td>
<td>BD [x]</td>
<td>BD [x]</td>
<td>BD [x]</td>
</tr>
<tr>
<td>50 Mbps</td>
<td>BD [x]</td>
<td>1.97</td>
<td>[x]</td>
<td>[x]</td>
<td>BD [x]</td>
<td>BD [x]</td>
<td>BD [x]</td>
<td>BD [x]</td>
</tr>
<tr>
<td>75 Mbps</td>
<td>BD [x]</td>
<td>2.24</td>
<td>[x]</td>
<td>[x]</td>
<td>BD [x]</td>
<td>BD [x]</td>
<td>BD [x]</td>
<td>BD [x]</td>
</tr>
<tr>
<td>100 Mbps</td>
<td>BD [x]</td>
<td>2.47</td>
<td>[x]</td>
<td>[x]</td>
<td>BD [x]</td>
<td>BD [x]</td>
<td>BD [x]</td>
<td>BD [x]</td>
</tr>
<tr>
<td>150 Mbps</td>
<td>BD [x]</td>
<td>2.66</td>
<td>[x]</td>
<td>[x]</td>
<td>BD [x]</td>
<td>BD [x]</td>
<td>BD [x]</td>
<td>BD [x]</td>
</tr>
<tr>
<td>200 Mbps</td>
<td>BD [x]</td>
<td>2.94</td>
<td>[x]</td>
<td>[x]</td>
<td>BD [x]</td>
<td>BD [x]</td>
<td>BD [x]</td>
<td>BD [x]</td>
</tr>
<tr>
<td>300 Mbps</td>
<td>BD [x]</td>
<td>3.16</td>
<td>[x]</td>
<td>[x]</td>
<td>BD [x]</td>
<td>BD [x]</td>
<td>BD [x]</td>
<td>BD [x]</td>
</tr>
<tr>
<td>400 Mbps</td>
<td>BD [x]</td>
<td>3.50</td>
<td>[x]</td>
<td>[x]</td>
<td>BD [x]</td>
<td>BD [x]</td>
<td>BD [x]</td>
<td>BD [x]</td>
</tr>
<tr>
<td>500 Mbps</td>
<td>BD [x]</td>
<td>3.76</td>
<td>[x]</td>
<td>[x]</td>
<td>BD [x]</td>
<td>BD [x]</td>
<td>BD [x]</td>
<td>BD [x]</td>
</tr>
<tr>
<td>1,000 Mbps</td>
<td>BD [x]</td>
<td>3.98</td>
<td>[x]</td>
<td>[x]</td>
<td>BD [x]</td>
<td>BD [x]</td>
<td>BD [x]</td>
<td>BD [x]</td>
</tr>
<tr>
<td>45 Mbps (DS3)</td>
<td>BD [x]</td>
<td>2.18</td>
<td>[x]</td>
<td>[x]</td>
<td>BD [x]</td>
<td>BD [x]</td>
<td>BD [x]</td>
<td>BD [x]</td>
</tr>
<tr>
<td>156 Mbps (STM-1)</td>
<td>BD [x]</td>
<td>2.97</td>
<td>[x]</td>
<td>[x]</td>
<td>BD [x]</td>
<td>BD [x]</td>
<td>BD [x]</td>
<td>BD [x]</td>
</tr>
<tr>
<td>622 Mbps (STM-4)</td>
<td>BD [x]</td>
<td>4.20</td>
<td>[x]</td>
<td>[x]</td>
<td>BD [x]</td>
<td>BD [x]</td>
<td>BD [x]</td>
<td>BD [x]</td>
</tr>
<tr>
<td>2,500 Mbps (STM-16)</td>
<td>BD [x]</td>
<td>5.95</td>
<td>[x]</td>
<td>[x]</td>
<td>BD [x]</td>
<td>BD [x]</td>
<td>BD [x]</td>
<td>BD [x]</td>
</tr>
</tbody>
</table>

* The gradients calculated by the Authority based on the formula described in paragraph 338.b provide a similar progression in the allocation of wholesale costs as for the retail costs allocated to Local MPLS Layer 2 service.

** The monthly unit cost per gradient-weighted wholesale service was calculated as follows: BD [x] = [x] / [x] × 1/12

Source: the Authority
As can be seen in the above table, the approach used by the Authority guarantees that Batelco fully recovers the non-network costs that were incurred in 2012 for the provision of wholesale data connections (i.e. the total of column H is BD [X]).

While the monthly wholesale unit cost derived by this approach is BD [X] per Connection, the Authority has decided to use a more conservative value of BD [X] per WLA or WDC Connection (i.e. uplift of 12.4%). This leaves some margin for any unexpected increase in wholesale costs that may be reported by Batelco in future RO submissions.

### 6.3 The Authority’s draft decision on the WLA and WDC charges

341. The revised cost stacks of the WLA and WDC charges are based on:

a. the unit cost adjustments made by the Authority (see details in previous sections); and

b. an additional mark-up of 20% on the WLA and WDC charges.

342. The Authority had already applied a 20% mark-up on the introductory MRC of the WLA (see the Authority's letter dated 27 September 2012, ref: MCD/09/12/125). The Authority considers that, in this very situation and with specific reference to the WLA and WDC products, it is still reasonable to consider such mark-up, for the following reasons:

a. additional costs that Batelco may incur in setting up and managing the Service Level monitoring platform for MPLS-based data connection services (i.e. Batelco NetView system);

b. additional costs that Batelco may incur in adapting its current wholesale processes and systems to align them with the newly defined service level framework (see section 3 above);

c. additional costs that Batelco may incur as a result of the revised and more stringent Service Levels applicable to the WLA and WDC products, and in particular, the automatic payment by Batelco of Service Level Penalties for failure to meet the defined Service Level Terms;

d. the material costs of setting up a centralised geographic database on fibre access and fibre usage which OLOs would be able to consult remotely (see paragraph 198 above);

e. any unexpected and material changes that may occur in the allocation of MPLS transmission costs for the 2015 and 2016 regulatory accounts (from the 2015 regulatory accounts and onwards, the allocation method of MPLS transmission costs is expected to change from average allocated bandwidth to peak bandwidth);

f. the uncertainty with regard to the investment required by Batelco to modernize its MPLS transmission network in 2016; and

g. the uncertainty with regard to the investment required by Batelco to extend the reach of its DWDM core transmission network. In that respect, the Authority notes that the coverage of Batelco’s DWDM network is currently limited to 9 service nodes. The 20% mark-up should thus provide Batelco with reasonable incentives to rapidly deploy DWDM equipment in other service nodes.
343. As the application of a 20% mark-up on the WLA speeds 64kbit/s and 128 kbit/s would result in higher MRC than currently defined for the WLA, the Authority has decided to keep the MRC applicable to such speeds at their current levels. This translates into a lower level of mark-up compared to the calculated cost-based MRC (i.e. mark-up of 13.0%, and 16.3% for the speeds 64kbit/s and 128 kbit/s respectively).

344. The Authority has also set the MRC applicable to the WDC Aggregation Link of 10 Gbit/s (i.e. STM-64) with a fully redundant fibre path at 500 BD/month. The Authority is confident that this amount will allow Batelco to fully recover all associated costs.

345. The Authority considers that the level of NRC which currently apply to the WLA for installation, configuration and additional work (see items 2-16.3 to 2-16.11 in the RO Schedule 3) are appropriate for the WDC.

346. Finally, the Authority sets the following charge premium:
   
a. "Premium Support" for a WLA or a WDC Connection: **20% on top of the applicable MRC** (the Premium Support is free when a charge premium is paid for an end-to-end logical and physical protection, see point (b) below); and

   b. End-to-end physical and logical protection of a WLA or WDC Connection: **30% on top of the applicable MRC**.

347. Pursuant to Article 57 of the Telecommunications Law and Article 5 of the Access Regulation issued 30 April 2005, the Authority sets the fair, reasonable and non-discriminatory MRC for WLA and WDC Connections as presented in Figure 29 and Figure 30 below.
Draft Order on the Reference Offer of Batelco
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Figure 29: Cost stack of the fair, reasonable and non-discriminatory WLA MRC (in BD per month)

<table>
<thead>
<tr>
<th>Speed</th>
<th>CPE</th>
<th>Fibre / copper access</th>
<th>MSAN</th>
<th>MPLS transmission</th>
<th>Non-network i.e. wholesale costs</th>
<th>Additional mark-up of 20%</th>
<th>FRND WLA MRC **</th>
<th>Existing WLA MRC</th>
<th>% difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>64 kbit/s</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>6.37</td>
<td>58.698</td>
<td>58.698</td>
<td>0.0%</td>
<td></td>
</tr>
<tr>
<td>128 kbit/s</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>10.84</td>
<td>64.600</td>
<td>65.872</td>
<td>-1.9%</td>
<td></td>
</tr>
<tr>
<td>512 kbit/s</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>11.29</td>
<td>67.700</td>
<td>75.692</td>
<td>-10.8%</td>
<td></td>
</tr>
<tr>
<td>1 Mbit/s</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>12.33</td>
<td>73.800</td>
<td>97.143</td>
<td>-24.0%</td>
<td></td>
</tr>
<tr>
<td>2 Mbit/s</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>14.46</td>
<td>86.300</td>
<td>138.879</td>
<td>-37.9%</td>
<td></td>
</tr>
<tr>
<td>4 Mbit/s</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>22.54</td>
<td>154.400</td>
<td>212.883</td>
<td>-26.9%</td>
<td></td>
</tr>
<tr>
<td>8 Mbit/s</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>27.33</td>
<td>163.500</td>
<td>344.053</td>
<td>-52.5%</td>
<td></td>
</tr>
<tr>
<td>10 Mbit/s</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>29.30</td>
<td>175.300</td>
<td>380.519</td>
<td>-53.9%</td>
<td></td>
</tr>
<tr>
<td>15 Mbit/s</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>33.51</td>
<td>200.900</td>
<td>462.389</td>
<td>-56.6%</td>
<td></td>
</tr>
<tr>
<td>20 Mbit/s</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>37.18</td>
<td>223.100</td>
<td>535.482</td>
<td>-58.3%</td>
<td></td>
</tr>
<tr>
<td>25 Mbit/s</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>40.60</td>
<td>243.200</td>
<td>602.652</td>
<td>-59.6%</td>
<td></td>
</tr>
<tr>
<td>50 Mbit/s</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>54.24</td>
<td>325.410</td>
<td>888.050</td>
<td>-63.4%</td>
<td></td>
</tr>
<tr>
<td>75 Mbit/s</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>65.43</td>
<td>392.300</td>
<td>1,127.512</td>
<td>-66.2%</td>
<td></td>
</tr>
<tr>
<td>100 Mbit/s</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>75.16</td>
<td>450.900</td>
<td>1,341.209</td>
<td>-66.4%</td>
<td></td>
</tr>
<tr>
<td>150 Mbit/s</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>92.28</td>
<td>553.600</td>
<td>1,721.257</td>
<td>-67.8%</td>
<td></td>
</tr>
<tr>
<td>200 Mbit/s</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>107.40</td>
<td>644.100</td>
<td>2,060.482</td>
<td>-68.7%</td>
<td></td>
</tr>
<tr>
<td>300 Mbit/s</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>133.93</td>
<td>803.100</td>
<td>2,663.772</td>
<td>-69.9%</td>
<td></td>
</tr>
<tr>
<td>400 Mbit/s</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>157.30</td>
<td>943.500</td>
<td>3,202.255</td>
<td>-70.5%</td>
<td></td>
</tr>
<tr>
<td>500 Mbit/s</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>178.66</td>
<td>1,071.700</td>
<td>3,697.169</td>
<td>-71.0%</td>
<td></td>
</tr>
<tr>
<td>1,000 Mbit/s</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>268.47</td>
<td>1,610.600</td>
<td>5,800.336</td>
<td>-72.2%</td>
<td></td>
</tr>
</tbody>
</table>

WLA Aggregation Link (1GbE; fibre-based) | [X] | [X] | [X] | [X] | 200.000 | 200.000 | 0% |

* for the speeds 64 kbit/s and 128 kbit/s, the Authority has decided to keep the charges at their current levels. The applicable % mark-up for such speeds is therefore less than 20%. ** The Authority has rounded-up WLA charges to the nearest decimal.

NB. As proposed by Authority in paragraph 231 above, the full end-to-end physical and logical protection shall be available for an additional 30% premium on top of the applicable MRC for the Connection. As proposed by the Authority in paragraph 287 above, the Premium Support shall be available for an additional 20% premium on top of the applicable MRC for the Connection.

Source: the Authority
Figure 30: Cost stack of the fair, reasonable and non-discriminatory WDC MRC (in BD per month)

<table>
<thead>
<tr>
<th>Speed</th>
<th>CPE</th>
<th>Fibre access</th>
<th>SDH/DWDM transmission *</th>
<th>Non-network i.e. wholesale costs</th>
<th>Additional mark-up of 20%</th>
<th>FRND WDC MRC **</th>
<th>Existing CAT/LLCO price ceilings (in black) and Batelco’s proposed MRC for WOBS (in italic blue)</th>
<th>% difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>45 Mbit/s (or DS3)</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>58.77</td>
<td>352.700</td>
<td>2,512.24</td>
<td>-86.0%</td>
</tr>
<tr>
<td>156 Mbit/s (or STM-1)</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>89.19</td>
<td>535.200</td>
<td>3,552.33</td>
<td>-84.9%</td>
</tr>
<tr>
<td>300 Mbit/s</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>118.89</td>
<td>713.400</td>
<td>3,787.00</td>
<td>-81.2%</td>
</tr>
<tr>
<td>400 Mbit/s</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>135.34</td>
<td>812.100</td>
<td>4,046.00</td>
<td>-77.7%</td>
</tr>
<tr>
<td>500 Mbit/s</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>150.31</td>
<td>901.900</td>
<td>8,185.21</td>
<td>-87.7%</td>
</tr>
<tr>
<td>622 Mbit/s (or STM-4)</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>167.16</td>
<td>1,003.000</td>
<td>8,185.21</td>
<td>-87.7%</td>
</tr>
<tr>
<td>750 Mbit/s</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>185.54</td>
<td>1,113.300</td>
<td>1,113.300</td>
<td></td>
</tr>
<tr>
<td>1,000 Mbit/s</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>214.92</td>
<td>1,289.600</td>
<td>4,574.00</td>
<td>-71.8%</td>
</tr>
<tr>
<td>1,250 Mbit/s</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>241.75</td>
<td>1,450.500</td>
<td>1,450.500</td>
<td></td>
</tr>
<tr>
<td>1,500 Mbit/s</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>266.71</td>
<td>1,600.300</td>
<td>1,600.300</td>
<td></td>
</tr>
<tr>
<td>2,000 Mbit/s</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>312.57</td>
<td>1,875.400</td>
<td>1,875.400</td>
<td></td>
</tr>
<tr>
<td>2,500 Mbit/s (or STM-16)</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>354.50</td>
<td>2,127.000</td>
<td>5,775.00</td>
<td>-63.2%</td>
</tr>
<tr>
<td>5,000 Mbit/s</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>561.08</td>
<td>3,366.500</td>
<td>3,366.500</td>
<td></td>
</tr>
<tr>
<td>7,500 Mbit/s</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>708.17</td>
<td>4,249.000</td>
<td>4,249.000</td>
<td></td>
</tr>
<tr>
<td>10,000 Mbit/s (or STM-64)</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>838.91</td>
<td>5,033.500</td>
<td>9,769.00</td>
<td>-48.5%</td>
</tr>
</tbody>
</table>

| WDC Aggregation Link (10 GbE/STM-64; fibre-based; including end-to-end physical and logical protection) | [X] | [X] | [X] | 500.00 |

* As initially proposed by Batelco for the WOBS costing, the Authority has allocated SDH/DWDM transmission costs based on a costing gradient defined as: gradient = (speed in Mbps / 2)^(2/3) ** The Authority has rounded-up the WDC charges to the nearest decimal.

NB. As proposed by Authority in paragraph 231 above, the full end-to-end physical and logical protection shall be available for an additional 30% premium on top of the applicable MRC for the Connection. As proposed by the Authority in paragraph 287 above, the Premium Support shall be available for an additional 20% premium on top of the applicable MRC for the Connection.

Source: the Authority
SUMMARY OF SUBMISSIONS ON SECTION 6

348. In this subsection, the Authority will add a summary of the submissions and cross-submissions (if any) received from stakeholders on section 6 (Review of the price terms applicable to the WLA and WDC products and services).

THE AUTHORITY’S FINAL CONCLUSIONS ON SECTION 6

349. In this subsection, the Authority will provide its final views and conclusions with regard to section 6 (Review of the price terms applicable to the WLA and WDC products and services).
7 Review of the non-price terms applicable to the Bitstream product and services

350. In the following section, the Authority reviews the non-price terms applicable to the Bitstream product and services.

CONSULTATION TEXT

351. As part of its review of the non-price terms applicable to the Bitstream product and services, the Authority has taken into account all reasonable comments received from OLOs in the past few years (either via letters or in meetings).

352. The Authority is of the view that the Bitstream service description should be clear to a non-technical reader and should detail all processes and interactions that Batelco and OLOs may have during the service request, delivery, and management of the Bitstream product and services.

7.1 General modifications to the Bitstream service description

**Bitstream product for business and mass-market packages**

353. Since the issuance on 27 March 2014 of the final “Determination of Significant Market Power and Determination of Dominant Position in the Markets for Provision of Broadband Internet Access Services from a Fixed Location” (ref: MCD/03/14/018), Batelco no longer holds a Dominant Position in the wholesale broadband access market for the supply of mass-market broadband internet access services from a fixed location. However, the Authority has determined that Batelco continues to hold a Dominant Position in the wholesale broadband access market for the supply of business broadband internet access services from a fixed location.28

354. Accordingly, the Authority considers that Batelco shall make clear that the Bitstream product and services are regulated for business packages but unregulated for mass-market packages.

**No minimum service period**

355. There is no mention of a Minimum Service Period in the current service description.

356. The Authority considers that the absence of a Minimum Service Period shall be made explicit in the Bitstream service description.

28 For more information on the Determination, please refer to page
357. Batelco currently delivers Bitstream Connections over its GPON access network.

358. The Authority considers that this shall be reflected in the service description. As such, Batelco shall make the following changes to the Bitstream description:

a. the definition of “ADSL Link” shall be replaced by “Access Link means the digital point-to-point communications between an End User Premises and the MSAN or OLT nearest to that End User Premises.”;

b. the word “DSL” shall be removed from the definition of “End User Premises Equipment”;

c. the definition of “MSAN” shall be amended to “MSAN means multi-service access node, network equipment in Batelco Exchange used in the provision of Bitstream Connections when the Access Link is based on ADSL technology (copper-based access).”;

d. the definition of “Useable Pair” shall be amended to “Useable Line means the copper access line or fibre access line to the End User over which the End User is acquiring a standard suite of telephone services provided by Batelco.”;

e. the definition of “Batelco Exchange (BE)” shall be amended to “Batelco Exchange (BE) means an exchange which has MSANs or OLTs installed at the time of the Service Request. The exchanges at which the Bitstream service is available are listed in annex.”;

f. the following definitions of GPON, OLT and ONT shall be added:

   i. “GPON means gigabit passive optical networks, an access technology used by Batelco to provide a fibre-based asymmetric connection at a fixed location.”

   ii. “OLT means optical line terminal, network equipment in Batelco Exchange used in the provision of a Bitstream Connection when the Access Link is based on GPON technology (fibre-based access).”;

   iii. “ONT means optical network terminal, network equipment in the End User Premises used in the provision of a Bitstream Connection when the Access Link is based on GPON technology (fibre-based access). The ONT is supplied, supported and maintained by Batelco.”

g. the definition of “Network Boundary” shall be amended to “Network Boundary means, for a copper-based Access Link, the Batelco distribution point at the End User Premises, and for a fibre-based Access Link, the ONT at the End User Premises.”

h. a technical diagram of the Bitstream service shall be added in an annex of the service description. The technical diagram shall represent a copper-based Access

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29 Batelco should ensure that the list of Batelco Exchanges included in annex is up to date.
Link and a fibre-based Access Link. The Authority proposes the following technical diagram (see Figure 31 below).

359. All the above changes to the definitions shall also be reflected in the Bitstream service description, and adjustments shall be made where necessary.

**Figure 31: The Authority's proposed technical diagram for the Bitstream Connection**

![Diagram of Bitstream Connection]

Source: the Authority

360. The above diagram is a technical description of the Bitstream product:

a. Bitstream Connections can be provided over two types of Access Links:
   
i. Copper-based DSL Access Link (see on ① the left end side of the diagram)
   
   ii. Fibre-based GPON Access Link (see on ② the bottom end side of the diagram).

b. the traffic of the two Bitstream Connections is aggregated in the Aggregation Link and handed over at the OLO's POP (see ③ on the right end side of the diagram).

**Other changes to the definitions of the Bitstream service description**

361. To improve the overall clarity and transparency of the Bitstream service description, and to align it with the framework for Service Levels defined in subsection 3.2 above, Batelco shall introduce, amend or remove the following definitions:

a. the terms “Connection” and “product” shall be introduced in the Bitstream definition. The Bitstream definition shall therefore be amended to “The **Bitstream** product is
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an access product which enables the Access Seeker to provide high speed products and services to its End Users via Connections over a digital pathway across the Access Provider’s network. The digital pathway consists of one or more Connections, involving one or more Access Links between End User premises and one or more Aggregation Links.”

b. the definition of “Connection” shall be introduced: “Connection” means the digital pathway that provides one end-to-end connection between one specific End User premises and the Access Seeker’s POP.”

c. the definition of “Aggregation Link” shall be amended to “Aggregation Link means the logical or physical link between an Aggregation Point and an Access Seeker’s Point Of Presence. For the avoidance of doubt, an Access Seeker must have Batelco establish at least one Aggregation Link before the implementation of the first Service Request.”

d. the definition of “Aggregation Point” shall be added: “Aggregation Point means the point on Batelco’s network where the Aggregation Link is connected.”

e. the definition of “ADSL” shall be expanded to describe this acronym completely.

f. the definitions of “Bitstream Change”, “Bitstream Change Request”, “Bitstream Request” and “Reversal Request” shall be removed and replaced by the following definitions.30

i. “Service Request: means a formal request for a service of the Bitstream product. Service Requests for the Bitstream product include New Connection Request, Change Request, Reversal Request, Transfer Request, and Cancellation Request.”

ii. “New Connection Request: means a Service Request for establishing a new Bitstream Connection for the provision of services to an End User at the premises of such End User.”

iii. “Transfer Request: means a Service Request for transferring an existing connection from one operator to another operator. For the avoidance of doubt, the existing connection may be provided as retail broadband service by Batelco and transferred as a Bitstream Connection to an OLO.

iv. “Upgrade/Downgrade Request: means a Service Request to upgrade /downgrade the speed of an existing Connection, where a Connection is already provided by an OLO for the provision of services to an End User at the same location.”

v. “Reconfiguration Request: means a Service Request for reconfiguring the technical parameters of an existing Connection.”

vi. “Reversal Request: means a Service Request for returning a Bitstream Service to its setup or configuration prior to the most recent Service Request. For the avoidance of doubt this type of Service Request can either be made

30 The Authority does not propose to define a Migration Request for Bitstream.
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by the OLO (on behalf of the End User) to Batelco or by the End User directly to Batelco.31

vii. “Cancellation Request: means a Service Request for discontinuing a
Bitstream Service.”

g. the definition of “Invalid Transfer” shall be amended to “Invalid Transfer means a
Service Request:

(a) where the End User (or its/her/his agent) did not request the services
that the Access Seeker intended to supply via a Bitstream Service;

(b) where a valid written End User Consent cannot be produced by the
Access Seeker to support the Service Request; or

(c) which resulted from a processing error.”

h. the word “incompatibility” in paragraph (d) of the “Service Qualification” definition
shall be capitalized. The Authority understands that, in this context, the word
“incompatibility” has the meaning provided by the definition of “Incompatibility”.

362. All the above changes to the definitions shall also be reflected in the Bitstream service
description, and adjustments shall be made where necessary.

Removal of the forecasting obligation

363. Pursuant to clause 7 of the Bitstream service description, OLOs must submit a 6-month
forecast of the expected requests for the Bitstream Service at the beginning of each
calendar month.

364. The Authority considers that OLOs should not have to submit such forecasts to Batelco for
the Bitstream Service. The Authority is of the view that Bitstream Connection forecasts are
of limited use to Batelco for the following reasons:

a. Forecasts are normally used by operators to plan ahead the dimensioning of the
network (e.g. placing orders for additional network cards from the equipment
vendor, installing additional uplink transmission capacity etc.), as well as to plan the
workforce (i.e. additional recruitment that may be required to cope with an expected
high increase in demand). Any variations in the quantity of Bitstream Service
Requests from one month to the other would only have a very limited incidence on
Batelco’s planning of operations as the number of Bitstream Connections is
relatively low compared to the overall number of retail broadband subscriptions.

b. Batelco has a better visibility on the potential evolution of the number of Bitstream
Service Requests than any single OLO. Batelco has past information on the total
volumes of retail broadband, WDSL and Bitstream services (broken down per
OLO). No other operator than Batelco has a better visibility of the evolution of the

31 The Authority understands that a Reversal Request will occur when a recent change has been implemented to a
Bitstream Service. If the configuration or setup is incorrect then either the OLO or the End User may request
Batelco to revert to the most recent Bitstream Request.
business broadband market. Based on retail and wholesale information, Batelco’s network teams can benefit from a consolidated view of current demand and can thus derive more accurate forecast. In other words, a forecast based on consolidated historic information would be more robust than the sum of forecast provided by OLOs.

c. As risk and uncertainty are central to forecasting, it is considered best practice that telecom operators carefully plan their operations by considering a margin of error (e.g. capacity mark-up for network dimensioning). While an unexpected, sudden and permanent change in the volume of Bitstream Connections is unlikely to occur, the Authority is nonetheless confident that Batelco would be prepared for such an eventuality.

365. The Authority is also of the view that the removal of the Bitstream forecasting requirement on OLOs would be equally beneficial to Batelco in so far as it simplifies the Bitstream overall process by reducing its ‘procedural’ aspect to the strict necessary.

366. Finally, the removal of the forecasting obligation from the Bitstream service description does not prevent Batelco’s wholesale team from developing and maintaining regular interactions with its wholesale customers. Through regular interactions with OLOs, Batelco can easily obtain their views on sales forecasts without the need of a formal process.

367. For the above reasons, the Authority considers that the forecasting requirement for Bitstream shall no longer be imposed on OLOs.

Extension of the notice period applicable to service termination

368. Under clause 3.3 of the current Bitstream service description, Batelco may cease to supply the Bitstream Service to an Access Seeker on 3 months prior written notice if a regulatory obligation to support or supply any specific Bitstream Service no longer applies.

369. The Authority considers that, in such case, a notice period of 3 months does not provide sufficient time for the concerned OLO to plan the migration of its existing retail customers to a similar or equivalent service using another wholesale service provided by Batelco or using its own network.

370. As such, the Authority considers that Batelco should change the notice period in this particular case from 3 months to 12 months.

371. The Authority also considers that OLOs should be the only party responsible for informing End Users (i.e. their retail customers) if their existing service will be migrated to another network at the end of the notice period.

Summary of the general modifications to be made to the Bitstream service description

372. In accordance with the above paragraphs, the Authority orders Batelco to modify its service description as follow:

a. **Bitstream product for business and mass-market packages:** Batelco shall make clear that the Bitstream product and services are regulated for business packages but unregulated for mass-market packages;
b. **No minimum service period**: Batelco shall explicitly mention that there is no minimum service period applicable to the Bitstream product;

c. **Bitstream available over GPON access**: Batelco shall modify the Bitstream service description in accordance with the requirements set in paragraphs 358 and 359 above;

d. **Other changes to the definitions of the Bitstream service description**: Batelco shall modify the Bitstream service description in accordance with the requirements set in paragraphs 361 and 362 above;

e. **Removal of the forecasting obligation**: the Authority orders Batelco to remove the forecasting requirement currently imposed on OLOs for the Bitstream product (i.e. clause 7 of the Bitstream service description) and to adjust the Bitstream service description accordingly.

f. **Extension of the notice period applicable to service termination**: the Authority orders Batelco to extend the notice period provided for by clause 3.3 of the service description from 3 months to 12 months. Batelco shall also make clear that, in case of notice under clause 3.3, the OLO shall be the only party responsible for informing End Users (i.e. their retail customers) if their existing service will be migrated to another network at the end of the notice period.

---

Q24. Do you agree with the Authority’s proposed modifications of the Bitstream service description? Please explain and justify your position.

---

7.2 **Introduction of Service Levels for the Bitstream product and services**

373. As indicated in subsection 3.1 page 22, the Authority is of the view that Batelco should introduce Service Levels for the Bitstream product and services in respect of business packages (hereafter business Bitstream).

374. In this section, the Authority sets the Service Levels that it considers fair and reasonable for the business Bitstream product and services.

375. Before setting the Service Levels of the business Bitstream, the Authority has considered the QoS performance reported by Batelco in the General QoS Reports (see paragraph 238 above) as well as international benchmarking where available. In setting the Service Levels, the Authority also took into consideration consumer protection aspects in line with its duties under Article 3(b) of the Telecommunications Law.

**Maximum Time for Service Request Acknowledgment**

376. In line with the service request process proposed by the Authority (see subsection 3.2.1 above) and related definitions (see subsection 3.3 above), the Authority sets the Maximum Time for Service Request Acknowledgment as follow:

a. during working hours: 15 minutes following receipt of the Service Request; and
b. outside working hours: 15 minutes following the start of the first working hour after receipt of the Service Request.

377. The Authority notes that Batelco can easily meet this maximum time by setting up an automatic notice of receipt.

**Maximum Time for Service Request Confirmation**

378. According to the Bitstream service description (see paragraphs 1.3 and 2.2 in “ANNEX 1 – BITSTREAM REQUEST PROCESS”), Batelco notifies the OLO of the acceptance or rejection of a Bitstream Service Request within 5WD. The Authority considers that 5 WD is excessive. One working day should be amply sufficient for Batelco to check that the Service Request Form is correctly filled out and meets all the requirements set in the service description. A parallel can, for instance, be made with the equivalent retail process: when a business customer wishes to sign-up for an internet broadband service, he will not leave the Batelco retail shop before a complete application form and contract have been signed.

379. In line with the service request process proposed by the Authority (see subsection 3.2.1 above) and related definitions (see subsection 3.3 above), the Authority therefore sets the Maximum Time for Service Request Confirmation to 1 WD. Absent any formal notice from Batelco during the Maximum Time for Service Request Confirmation, the Service Request is deemed to have been accepted by Batelco.

**Maximum Time for Notification of Expected RFT and RFS Dates**

380. The Authority considers that Batelco should provide the notice of Expected RFT and RFS Date within 2 WD from the acceptance of the Service Request.

381. In the case of a Cancellation Request, Batelco shall only provide the Maximum RFS Date, which shall be the expected date of cancellation.

**Penalties for Notification of Expected RFT and RFS Dates**

382. The Authority proposes to set the same Penalties for Notification of Expected RFT and RFS Dates as it did for the WDC:

   a. 5 Service Credits (‘SC’) for each WD after the Maximum Time for Notification of Expected RFT and RFS Dates until such time as the OLO receives the notice.

**Acceptance Criteria and Quality of Service Parameters**

383. The Authority is of the view that Batelco should provide a clear description of the Acceptance Criteria that would be applicable to the Bitstream Service. The underlying process should also be documented in the Bitstream service description.

384. The same requirement applies to the QoS Parameters which shall also be proposed by Batelco and documented in the Bitstream service description.
Maximum Verification Time, Delivery Time Threshold, and Delivery Time Penalties

385. In line with the service delivery process proposed by the Authority (see subsection 3.2.2 above) and related definitions (see subsection 3.3 above), the Authority sets the following Service Levels:

a. **Maximum Validation Time**: 2 WD. The Authority considers that 2 WD offers ample time for the OLO to check that the Connection has been correctly provisioned.

b. **Maximum Delivery Time**: 7 WD; and

c. **Penalties for RFS Date**: 20 SC for failure to meet the Maximum RFS Date and 10 SC for each additional working day thereafter until the OLO receives the RFS Certificate. The Penalties for RFS Date are also subject to the provisions defined at paragraph 106 above.

386. In cases of Transfer Requests, Batelco shall coordinate the deactivation and activation of the Connection on the same day to ensure minimum service disruption.

387. The Authority has set the Maximum Delivery Time at 7 WD based on the average Bitstream delivery time from 2012 to 2014, as reported by Batelco in the General QoS Reports (see below figure).

**Figure 32: Batelco's reported QoS performance for the Delivery of the Bitstream Service (2012-2014)**

<table>
<thead>
<tr>
<th></th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Q1</td>
<td>Q2</td>
<td>Q3</td>
</tr>
<tr>
<td>New additions of Bitstream Service during the quarter</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
</tr>
<tr>
<td>Mean Delivery (in days)</td>
<td>1.4</td>
<td>0.6</td>
<td>0.5</td>
</tr>
<tr>
<td>Standard Deviation (in days)</td>
<td>2.4</td>
<td>1.5</td>
<td>2.0</td>
</tr>
<tr>
<td>Supply Time (95th percentile) (in days)</td>
<td>6.7</td>
<td>2.7</td>
<td>2.3</td>
</tr>
</tbody>
</table>

Source: General QoS Reports submitted by Batelco pursuant to the QoS Regulation

388. Over the 2012-2014 period, the Authority notes that:

a. the average delivery time of the Bitstream Service was 1.2 days; and

b. at the 95th percentile, Bitstream Connections were delivered in 5.1 days.

389. The Authority therefore concludes that, as the 7-WD Maximum Delivery Time includes the 2-WD Maximum Validation Time, it is set at the right level to incentivize Batelco to improve the performance of the business Bitstream delivery.
Fault management (i.e. Maximum Acknowledgment Time, Maximum Response Time, Maximum Restoration Time, and Penalties for Restoration Time)

390. In line with the fault management process proposed by the Authority (see subsection 3.2.4 above) and related definitions (see subsection 3.3 above), the Authority sets the following Service Levels:

a. Maximum Acknowledgment Time: 1 hour
b. **Maximum Response Time**: 5 working hours during working hours and 12 hours outside working hours;
c. Maximum Restoration Time: 24 hours
d. **Penalties for Restoration Time**: 10 SC for failure to meet the Maximum Restoration Time and 5 SC for every 4 hours exceeding the Maximum Restoration Time; and
e. **Maximum Monthly Penalty Cap**: 300 SC per Connection and per month.

391. The Authority has considered the General QoS Reports submitted by Batelco when setting the Maximum Restoration Time. Based on such reports, the Authority has derived the following average indicators for the period 2012-2014 (see below Figure)

**Figure 33: 2012-2014 average fault repair time for the Bitstream and the Batelco retail broadband services**

<table>
<thead>
<tr>
<th></th>
<th>Bitstream Service</th>
<th>Retail broadband service</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012-2014 average monthly fault rate (in % of services)</td>
<td>2.0%</td>
<td>2.2%</td>
</tr>
<tr>
<td>2012-2014 average fault repair time (in hours)</td>
<td>71.9 hours</td>
<td>21.9 hours</td>
</tr>
<tr>
<td>2012-2014 95th percentile average fault repair time (in hours)</td>
<td>237.9 hours</td>
<td>199.0 hours</td>
</tr>
</tbody>
</table>

Source: The Authority based on the General QoS Reports submitted by Batelco

392. While Bitstream and Batelco’s retail broadband present similar fault rates over the 3-year period, the Authority notes that it takes, on average, 3.3 times more time for a Bitstream fault to be repaired (71.9 hours) than a retail broadband fault (21.9 hours).

393. It is not clear to Authority why there is such a large difference between the average restoration time of retail and wholesale services. In all cases, the Authority considers Batelco’s fault management performance to be very unsatisfactory.

394. Internet access and other connectivity services are becoming more and more important for the day-to-day business activities. The Authority considers that 24 hours should be the maximum time allowed for restoring a Connection used by a business customer.

395. The Authority proposes to set the Maximum Monthly Penalty Cap for business Bitstream at 300 SC (i.e. 300% of the regulated monthly charge).

**Summary of Service Levels applicable to the Bitstream product and services used for businesses**
For ease of reference, the Authority has summarized all Service Levels and associated Service Level Penalties applicable to the business Bitstream product and services in the following table.

**Figure 34: Summary of the proposed Service Levels for the Bitstream product and services used for businesses**

<table>
<thead>
<tr>
<th>Service Levels</th>
<th>Service Level Terms</th>
<th>Service Level Penalties</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Service request process</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Service Request Acknowledgment</td>
<td>Maximum Time for Service Request Acknowledgment:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>During working hours: <strong>15 minutes</strong> following receipt of the Service Request</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Outside working hours: <strong>15 minutes after the start of the first working hour</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>following receipt of the Service Request</td>
<td></td>
</tr>
<tr>
<td>Service Request Confirmation</td>
<td>Maximum Time for Service Request Confirmation: <strong>1 WD</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Service delivery process</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Notification of Expected RFT</td>
<td>Maximum Time for Notification of Expected RFT and RFS Dates: <strong>2 WD</strong></td>
<td>Penalties for Notification of Expected RFT and RFS Dates: <strong>5 Service Credits ('SC')</strong> for each WD after the Maximum Time for Notification of Expected RFT and RFS Dates until such time as the OLO receives the notice.</td>
</tr>
<tr>
<td>and RFS Dates</td>
<td>For a Cancellation Request, Batelco shall only provide the Maximum RFS Date, which shall be the expected date of cancellation, taking into account the required notice period for cancellation.</td>
<td></td>
</tr>
<tr>
<td>Service Level for RFS Date</td>
<td>Maximum Delivery Time: <strong>7 WD</strong></td>
<td>Penalties for RFS Date: <strong>20 SC</strong> for failure to meet the Maximum RFS Date and <strong>10 SC</strong> for each additional working day thereafter until the OLO receives the RFS Certificate.</td>
</tr>
<tr>
<td></td>
<td>In cases of Transfer Requests, Batelco shall coordinate the deactivation and activation of the Connection on the same day to ensure minimum service disruption.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Maximum Validation Time: <strong>2 WD</strong></td>
<td></td>
</tr>
<tr>
<td>Acceptance Criteria</td>
<td>To be defined by Batelco</td>
<td></td>
</tr>
<tr>
<td><strong>Service quality management</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>QoS Parameters</td>
<td>To be defined by Batelco</td>
<td></td>
</tr>
<tr>
<td><strong>Fault management process</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Service Levels

<table>
<thead>
<tr>
<th>Service Levels</th>
<th>Service Level Terms</th>
<th>Service Level Penalties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fault Acknowledgment Time</td>
<td>Maximum Fault Acknowledgment Time: 1 hour</td>
<td></td>
</tr>
<tr>
<td>Response Time</td>
<td>Maximum Response Time: 5 working hours during working hours and 12 hours outside working hours</td>
<td>Penalties for Restoration Time: 10 SC for failure to meet the Maximum Restoration Time + 5 SC for every 4 hours exceeding the Maximum Restoration Time</td>
</tr>
<tr>
<td>Restoration Time</td>
<td>Maximum Restoration Time: 24 hours</td>
<td>Maximum Monthly Penalty Cap: 300 SC per Connection and per month</td>
</tr>
</tbody>
</table>

Source: the Authority

397. For the above reasons and pursuant to Articles 3(b) (1), 57(b) and 57(e) of the Telecommunication Law, and Article 4.2 of the Access Regulation, the Authority orders Batelco to:

a. implement Service Levels for the business Bitstream product and services in line with:
   i. the Service Level Framework detailed in subsection 3.2, page 25;
   ii. the Service Level definitions detailed in subsection 3.3, page 42;
   iii. the Service Level Terms and Penalties detailed in Figure 34 above;

b. define and document in the service description the Acceptance Criteria and QoS Parameters that shall be applicable to the business Bitstream;

c. include a summary table of the Service Level Terms and Penalties in the Bitstream service description in the format detailed in subsection 0, page 47 (see Figure 34 above).

Q25. Do you agree with the Authority’s proposed Service Level Terms and Penalties for the business Bitstream product and services. Please explain and justify your position.
SUMMARY OF SUBMISSIONS ON SECTION 7

398. In this subsection, the Authority will add a summary of the submissions and cross-submissions (if any) received from stakeholders on section 7 (Review of the non-price terms applicable to the Bitstream).

THE AUTHORITY’S FINAL CONCLUSIONS ON SECTION 7

399. In this subsection, the Authority will provide its final views and conclusions with regard to section 7 (Review of the non-price terms applicable to the Bitstream).
8 Review of price terms applicable to the Bitstream and Business WDSL products and services

CONSULTATION TEXT

400. The Authority does not propose any modifications to the regulated charges applicable to the Bitstream and the Business WDSL products and services.

401. The regulated MRC were extensively reviewed by the Authority in 2014, following the submission by Batelco of the Notified Controlled Tariffs 59 (“NCT 59 Business Broadband Retail Tariff Notification”) pursuant to provisions of the Retail Notification Regulation dated 21 February 2010 (ref: LAU/0509/119).

402. As part of the NCT 59, Batelco was proposing to reduce the prices of its retail business broadband packages. To prevent any margin squeeze occurring between the proposed revised retail prices and the wholesale charges, the Authority had to review the regulated charges applicable to the Business WDSL and Business Bitstream services. They were implemented by Batelco on 3 March 2014.

403. While the review of the charges was based on Batelco’s 2011 regulatory accounts (i.e. the latest regulatory accounts available at the time), the Authority had made several forward-looking adjustments to the cost components of the charges (e.g. MPLS transmission, Inet Platform and International Uplinks).

404. Based on the MPLS transmission cost trend derived from the core network BU cost model (see paragraphs 322 to 326 above), the Authority notes that it could have ordered lower MRC for the business Bitstream in the region of -10% to -25%. However, such reductions should not be considered in the present context for the following reasons:

a. **Introduction of a binding Service Levels for business Bitstream:** the Authority anticipates that Batelco may incur additional costs for the introduction and management of the new Service Levels for Bitstream; and

b. **No margin squeeze:** There remains sufficient margin between the retail and wholesale product prices for OLOs to compete against Batelco in the relevant retail markets;

c. **Promotion of fibre access roll-out:** the Authority is also minded to maintain Batelco’s incentives to further deploy its fibre access network in Bahrain.

Q26. Do you agree with the Authority’s proposal to freeze the charges applicable to the business Bitstream and business WDSL? Please explain and justify your position.
SUMMARY OF SUBMISSIONS ON SECTION 8

405. In this subsection, the Authority will add a summary of the submissions and cross-submissions (if any) received from stakeholders on section 8 (Review of price terms applicable to the Bitstream and Business WDSL products and services).

THE AUTHORITY’S FINAL CONCLUSIONS ON SECTION 8

406. In this subsection, the Authority will provide its final views and conclusions with regard to section 8 (Review of price terms applicable to the Bitstream and Business WDSL products and services).
9 Review of ISI/CSI link services

CONSULTATION TEXT

407. Batelco submits the following cost stacks for the ISI and CSI link services (see Figure 35 below).

Figure 35: Cost stack submitted by Batelco for the CSI and ISI link services

<table>
<thead>
<tr>
<th>CSI Link Service – Yr 2012 Cost (LRIC)</th>
<th>1 to 14</th>
<th>15 to 28</th>
<th>29 to 42</th>
<th>43 to 63</th>
<th>Signalling</th>
</tr>
</thead>
<tbody>
<tr>
<td>SDH Transmission</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LRIC SDH Transmission cost 2012</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
</tr>
<tr>
<td>E1 total capacity</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
</tr>
<tr>
<td>Total cost per E1</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
</tr>
<tr>
<td>DDF Cost</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
</tr>
<tr>
<td>ODF Cost</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
</tr>
<tr>
<td>Core Huawei port per OLO</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
</tr>
<tr>
<td>OSN 3500 per OLO</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
</tr>
<tr>
<td>Average no. of E1 per OLO</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
</tr>
<tr>
<td>Minimum</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
</tr>
<tr>
<td>Maximum</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
</tr>
<tr>
<td>Cost per E1</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
</tr>
<tr>
<td>Cost per Port</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
</tr>
<tr>
<td>Access Fibre Cost</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
</tr>
<tr>
<td>Access Fibre Cost (as TRA’s order 2009)</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
</tr>
<tr>
<td>total number of fiber pairs</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
</tr>
<tr>
<td>Annual access fibre cost per access</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
</tr>
<tr>
<td>Annual access fibre cost per E1</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
</tr>
<tr>
<td>Total cost per E1 pa</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
</tr>
<tr>
<td>Total cost per E1 pm</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
</tr>
<tr>
<td>Total cost per Port pa</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
</tr>
<tr>
<td>Total cost per Port pm</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
</tr>
<tr>
<td>Total per mth</td>
<td>284.45</td>
<td>163.72</td>
<td>138.22</td>
<td>121.73</td>
<td>25.21</td>
</tr>
</tbody>
</table>
### ISI Link Service — Yr 2012 Cost (LRIC)

<table>
<thead>
<tr>
<th>SDH Transmission</th>
<th>1 to 14</th>
<th>15 to 28</th>
<th>29 to 42</th>
<th>43 to 63</th>
<th>Signalling</th>
</tr>
</thead>
<tbody>
<tr>
<td>LRIC SDH Transmission cost 2012</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>E1 total capacity</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>Total cost per E1</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
</tbody>
</table>

#### Additional Network Elements

| Core Huawei port per OLO | [ ] | [ ] | [ ] | [ ] | [ ] |
| Joining Box | [ ] | [ ] | [ ] | [ ] | [ ] |
| Average no. of E1 per OLO | [ ] | [ ] | [ ] | [ ] | [ ] |
| Cost per E1 | [ ] | [ ] | [ ] | [ ] | [ ] |

#### Fibre Cost

(as TRA's order 2009)

| Access Fibre Cost | [ ] | [ ] | [ ] | [ ] | [ ] |
| total number of fiber pairs | [ ] | [ ] | [ ] | [ ] | [ ] |
| Annual access fibre cost per access | [ ] | [ ] | [ ] | [ ] | [ ] |
| Annual access fibre cost per E1 | [ ] | [ ] | [ ] | [ ] | [ ] |

| Total cost per E1 pa | [ ] | [ ] | [ ] | [ ] | [ ] |
| Total cost per E1 pm | [ ] | [ ] | [ ] | [ ] | [ ] |

**Total per mth**: 123.88 107.71 104.30 102.56 25.21

Source: Batelco’s RO submission dated 16 October 2014 (ref: GCL/389/14), 2012 Based CSI ISI Cost Stacks.xlsx
The Authority notes that the charges proposed by Batelco for the ISI and CSI services are considerably higher than the current regulated charges (see Figure 36 below).

**Figure 36: Comparison of current ISI/CSI charges with Batelco’s proposed charges**

<table>
<thead>
<tr>
<th>Chargeable activity</th>
<th>Currently implemented charges</th>
<th>Batelco’s submitted charges in October 2014</th>
<th>Difference (in %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISI Link services (1-1)</td>
<td>in BD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-1.5A – ISI Link – Port and E1 line rental for unilateral traffic routes – 1-14 links</td>
<td>48,599</td>
<td>123,880</td>
<td>154.9%</td>
</tr>
<tr>
<td>1-1.5B – ISI Link -Port and E1 line rental for unilateral traffic routes – 15-28 links</td>
<td>30,181</td>
<td>107,710</td>
<td>256.9%</td>
</tr>
<tr>
<td>1-1.5C – ISI Link -Port and E1 line rental for unilateral traffic routes – 29-42 links</td>
<td>26,002</td>
<td>104,300</td>
<td>301.1%</td>
</tr>
<tr>
<td>1-1.5D – ISI Link -Port and E1 line rental for unilateral traffic routes – 43-63 links</td>
<td>24,003</td>
<td>102,560</td>
<td>327.3%</td>
</tr>
<tr>
<td>1-1.12 – ISI Link -Signalling Link rental</td>
<td>25,366</td>
<td>25,210</td>
<td>-0.6%</td>
</tr>
<tr>
<td>CSI Link services (1-2)</td>
<td>in BD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-2.2A – CSI Link Rent (Basic) – 1-14 Links</td>
<td>169,039</td>
<td>284,450</td>
<td>68.3%</td>
</tr>
<tr>
<td>1-2.2B – CSI Link Rent (Basic) – 15-28 Links</td>
<td>73,195</td>
<td>163,720</td>
<td>123.7%</td>
</tr>
<tr>
<td>1-2.2C – CSI Link Rent (Basic) – 29-42 Links</td>
<td>51,447</td>
<td>138,220</td>
<td>168.7%</td>
</tr>
<tr>
<td>1-2.2D – CSI Link Rent (Basic) – 43-63 Links</td>
<td>41,046</td>
<td>121,730</td>
<td>196.6%</td>
</tr>
<tr>
<td>1-2.11 – CSI Link -Signalling Link rental</td>
<td>25,366</td>
<td>25,210</td>
<td>-0.6%</td>
</tr>
</tbody>
</table>

Source: the Authority

Following the review of the above cost stacks, the Authority notes that Batelco has significantly departed from the costing methodology set by the Authority in the Reference Offer Order issued on 14 May 2012 (ref: 05/12/072):

a. Batelco has not applied the approach followed by the Authority to derive the cost of network equipment:

i. The price of equipment has not been adjusted to reflect the downward annual price trend of electronic equipment;

ii. The return on capital employed has been calculated by multiplying the WACC by the equipment price, instead of multiplying the WACC by the average Net Book Value of such equipment; and

iii. The equipment maintenance cost has been derived based on maintenance mark-up applicable to the passive assets of Batelco’s access network (assets which are very different from active equipment both in terms of investment and maintenance requirements).
b. Batelco has not applied the approach followed by the Authority to derive the cost of access fibre. Based on Batelco's calculations, the full unit cost of fibre access is wrongly allocated to each E1 when it should be allocated on a per link basis.

410. For the above reasons, the Authority considers that the charges proposed by Batelco are unfair and unreasonable.

411. The Authority has revised Batelco's calculations based on the costing methodology set in the 2012 RO Order.

412. While the Authority's calculations have resulted lower charges than current regulated charges (~ -15% to -25% lower), the Authority nonetheless considers that the current ISI/CSI charges are fair and reasonable, and should not be reduced.

413. To justify its decision, the Authority notes that ISI and CSI charges are already subject to a reassessment mechanism which is detailed in the Annex 2 of the RO Schedule 3 ("SCHEDULE 3 – ANNEX 2 CALCULATION OF TRAFFIC BASED REASSESSMENT OF E1 CHARGES"). The Authority therefore does not considers appropriate to further reduce ISI/CSI charges, and as such, has decided to freeze them at their current level.

Q27. Do you agree with the Authority’s proposal to freeze the charges applicable to the ISI and CSI link services? Please explain and justify your position.

SUMMARY OF SUBMISSIONS ON SECTION 9

414. In this subsection, the Authority will add a summary of the submissions and cross-submissions (if any) received from stakeholders on section 9 (Review of ISI/CSI link services).

THE AUTHORITY’S FINAL CONCLUSIONS ON SECTION 9

415. In this subsection, the Authority will provide its final views and conclusions with regard to section 9 (Review of ISI/CSI link services).
10 Review of other wholesale services

CONSULTATION TEXT

416. The other wholesale services reviewed in this section include:
   a. the emergency call access service (199,999,99x);
   b. the directory assistance service (181 and 188);
   c. the inter-operator transit service; and
   d. the carrier preselect access service.

10.1 Cost stacks submitted by Batelco for the other wholesale services

417. Batelco submitted the following cost stacks for the ancillary wholesale services:

Figure 37: Cost stack submitted by Batelco for the emergency call access service (199,999,99x)

<table>
<thead>
<tr>
<th>Item Ref</th>
<th>Code</th>
<th>Network Element</th>
<th>AS cost per minute LIRIC</th>
<th>Routing Factor %</th>
<th>2012 Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>950g</td>
<td>CN04 [Soft Switch (inc MRS)]</td>
<td></td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
</tr>
<tr>
<td></td>
<td>CN05 [MSAN Common Card Voice]</td>
<td></td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
</tr>
<tr>
<td></td>
<td>CN06 [Universal Media Gateway (UMG)]</td>
<td></td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
</tr>
<tr>
<td></td>
<td>CN07 [ICG Soft Switch]</td>
<td></td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
</tr>
<tr>
<td></td>
<td>CN20 [Distribution - Core Link (Voice)]</td>
<td></td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
</tr>
<tr>
<td></td>
<td>CN22 [Aggregation - Distribution Link (Voice)]</td>
<td></td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
</tr>
<tr>
<td></td>
<td>CN24 [MSAN - Aggregation Link (Voice)]</td>
<td></td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
</tr>
<tr>
<td></td>
<td>CN30 [MPLS Distribution Routers (Voice) - UMG Link]</td>
<td></td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
</tr>
<tr>
<td></td>
<td>CN32 [Core - Core Link (Voice)]</td>
<td></td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
</tr>
<tr>
<td></td>
<td>CN39 [MPLS Core Voice]</td>
<td></td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
</tr>
<tr>
<td></td>
<td>CN41 [MPLS Aggregation (Voice)]</td>
<td></td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
</tr>
<tr>
<td></td>
<td>CN57 [MPLS Distribution Routers (Voice)]</td>
<td></td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SUBTOTAL</td>
<td>0.333</td>
<td>[X]</td>
</tr>
<tr>
<td></td>
<td>CN90 [Interconnect Specific]</td>
<td></td>
<td>[X]</td>
<td>1.000</td>
<td>[X]</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>TOTAL</td>
<td>5.403</td>
<td></td>
</tr>
</tbody>
</table>

Source: Batelco’s RO submission dated 16 October 2014 (ref: GCL/389/14)
Figure 38: Cost stack submitted by Batelco for the directory assistance service (181 and 188)

<table>
<thead>
<tr>
<th>Item Ref</th>
<th>Code</th>
<th>Network Element</th>
<th>AS cost per minute LIRIC</th>
<th>Routing Factor %</th>
<th>2012 Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>950l Directory Assistance Service (181&amp;188)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CN04</td>
<td>CN04</td>
<td>[Soft Switch (inc MRS)]</td>
<td>0.007</td>
<td>[X]</td>
<td>[X]</td>
</tr>
<tr>
<td>CN05</td>
<td>CN05</td>
<td>[MSAN Common Card Voice]</td>
<td>1.000</td>
<td>[X]</td>
<td>[X]</td>
</tr>
<tr>
<td>CN06</td>
<td>CN06</td>
<td>[Universal Media Gateway (UMG)]</td>
<td>1.000</td>
<td>[X]</td>
<td>[X]</td>
</tr>
<tr>
<td>CN07</td>
<td>CN07</td>
<td>[ICG Soft Switch]</td>
<td>0.005</td>
<td>[X]</td>
<td>[X]</td>
</tr>
<tr>
<td>CN20</td>
<td>CN20</td>
<td>[Distribution - Core Link (Voice )]</td>
<td>1.000</td>
<td>[X]</td>
<td>[X]</td>
</tr>
<tr>
<td>CN22</td>
<td>CN22</td>
<td>[Aggregation - Distribution Link ( Voice)]</td>
<td>1.000</td>
<td>[X]</td>
<td>[X]</td>
</tr>
<tr>
<td>CN24</td>
<td>CN24</td>
<td>[MSAN - Aggregation Link (Voice)]</td>
<td>1.000</td>
<td>[X]</td>
<td>[X]</td>
</tr>
<tr>
<td>CN30</td>
<td>CN30</td>
<td>[MPLS Distribution Routers ( Voice ) - UMG Link]</td>
<td>1.000</td>
<td>[X]</td>
<td>[X]</td>
</tr>
<tr>
<td>CN32</td>
<td>CN32</td>
<td>[Core - Core Link (Voice)]</td>
<td>1.000</td>
<td>[X]</td>
<td>[X]</td>
</tr>
<tr>
<td>CN39</td>
<td>CN39</td>
<td>[MPLS Core Voice]</td>
<td>1.000</td>
<td>[X]</td>
<td>[X]</td>
</tr>
<tr>
<td>CN41</td>
<td>CN41</td>
<td>[MPLS Aggregation ( Voice )]</td>
<td>1.000</td>
<td>[X]</td>
<td>[X]</td>
</tr>
<tr>
<td>CN57</td>
<td>CN57</td>
<td>[MPLS Distribution Routers ( Voice )]</td>
<td>1.000</td>
<td>[X]</td>
<td>[X]</td>
</tr>
<tr>
<td>CN63</td>
<td>CN63</td>
<td>[Directory Services ( DQ ))]</td>
<td>1.000</td>
<td>[X]</td>
<td>[X]</td>
</tr>
<tr>
<td>MN25</td>
<td>MN25</td>
<td>[MGW - SMS platform Link]</td>
<td>1.000</td>
<td>[X]</td>
<td>[X]</td>
</tr>
<tr>
<td>MN40</td>
<td>MN40</td>
<td>[SMS Platform]</td>
<td>1.000</td>
<td>[X]</td>
<td>[X]</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Batelco’s RO submission dated 16 October 2014 (ref: GCL/389/14)

Figure 39: Cost stack submitted by Batelco for the inter-operator transit service

<table>
<thead>
<tr>
<th>Item Ref</th>
<th>Code</th>
<th>Network Element</th>
<th>AS cost per minute LIRIC</th>
<th>Routing Factor %</th>
<th>2012 Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>950q ITAS (Inter-Operator Transit Service)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CN06</td>
<td>CN06</td>
<td>[Universal Media Gateway (UMG)]</td>
<td>2.000</td>
<td>[X]</td>
<td>[X]</td>
</tr>
<tr>
<td>CN07</td>
<td>CN07</td>
<td>[ICG Soft Switch]</td>
<td>0.016</td>
<td>[X]</td>
<td>[X]</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Batelco’s RO submission dated 16 October 2014 (ref: GCL/389/14)
### Figure 40: Cost stack submitted by Batelco for the carrier preselect access service

<table>
<thead>
<tr>
<th>Item Ref</th>
<th>Code</th>
<th>Network Element</th>
<th>AS cost per minute LIRIC</th>
<th>Routing Factor %</th>
<th>2012 Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>CN04</td>
<td>CN04</td>
<td>[Soft Switch (inc MRS)]</td>
<td>0.004</td>
<td>[x]</td>
<td></td>
</tr>
<tr>
<td>CN05</td>
<td>CN05</td>
<td>[MSAN Common Card Voice]</td>
<td></td>
<td>1.000</td>
<td>[x]</td>
</tr>
<tr>
<td>CN06</td>
<td>CN06</td>
<td>[Universal Media Gateway (UMG)]</td>
<td></td>
<td>1.000</td>
<td>[x]</td>
</tr>
<tr>
<td>CN07</td>
<td>CN07</td>
<td>[ICG Soft Switch]</td>
<td></td>
<td>0.003</td>
<td>[x]</td>
</tr>
<tr>
<td>CN20</td>
<td>CN20</td>
<td>[Distribution - Core Link (Voice)]</td>
<td></td>
<td>1.000</td>
<td>[x]</td>
</tr>
<tr>
<td>CN22</td>
<td>CN22</td>
<td>[Aggregation - Distribution Link (Voice)]</td>
<td></td>
<td>1.000</td>
<td>[x]</td>
</tr>
<tr>
<td>CN24</td>
<td>CN24</td>
<td>[MSAN - Aggregation Link (Voice)]</td>
<td></td>
<td>1.000</td>
<td>[x]</td>
</tr>
<tr>
<td>CN30</td>
<td>CN30</td>
<td>[MPLS Distribution Routers (Voice) - UMG Link]</td>
<td></td>
<td>1.000</td>
<td>[x]</td>
</tr>
<tr>
<td>CN32</td>
<td>CN32</td>
<td>[Core - Core Link (Voice)]</td>
<td></td>
<td>1.000</td>
<td>[x]</td>
</tr>
<tr>
<td>CN39</td>
<td>CN39</td>
<td>[MPLS Core Voice]</td>
<td></td>
<td>1.000</td>
<td>[x]</td>
</tr>
<tr>
<td>CN41</td>
<td>CN41</td>
<td>[MPLS Aggregation (Voice)]</td>
<td></td>
<td>1.000</td>
<td>[x]</td>
</tr>
<tr>
<td>CN51</td>
<td>CN51</td>
<td>[UMG - ISDN Link]</td>
<td></td>
<td>0.569</td>
<td>[x]</td>
</tr>
<tr>
<td>CN57</td>
<td>CN57</td>
<td>[MPLS Distribution Routers (Voice)]</td>
<td></td>
<td>1.000</td>
<td>[x]</td>
</tr>
<tr>
<td><strong>SUBTOTAL</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CN90</td>
<td>CN90</td>
<td>[Interconnect Specific]</td>
<td></td>
<td>1.000</td>
<td>[x]</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td></td>
<td></td>
<td>2.826</td>
<td></td>
</tr>
</tbody>
</table>

Source: Batelco’s RO submission dated 16 October 2014 (ref: GCL/389/14)
10.2 The Authority’s review of the ancillary wholesale services charges

418. The Authority makes the following comments on the above cost stacks:

a. **Soft Switch** (i.e. CN04 [Soft Switch (inc MRS)]): the Authority notes that in 2011, Batelco changed the cost allocation driver of the network element CN04 ‘Soft Switch (inc MRD)’ from capacity traffic to transactional traffic, i.e. from number of minutes to number of calls. The change of cost allocation driver has had a significant impact on the unit cost of CN04 for several interconnection services;

b. **Interconnection gateway** (i.e. CN07 [ICG Soft Switch]: The cost allocation driver of CN07 has also changed from capacity traffic to transactional traffic in 2012;

c. **Interconnect Specific Charge** (i.e. CN90 [Interconnect Specific]): the Authority notes that the unit cost of CN90 has almost doubled between 2011 and 2012. This is mainly due to an increase in total interconnect specific cost and a decrease of interconnection traffic; and

d. **Emergency services**: it would appear that Batelco proposes to merge all call access services to emergency services under one service charge.

419. The Authority has reviewed the cost stacks submitted by Batelco.

420. The Authority considers that the above proposed charges have been correctly and fairly calculated by Batelco. As such, the Authority approves Batelco’s proposed charges.

421. However, in relation to the Carrier Pre-Select ("CPS") Service, the Authority is of the view that cost recovery surcharge (see charge item 2-13.8 in Schedule 3 of Batelco’s RO), which is currently set at 4.2 fils/min, is no longer justified. The Authority expects that all costs incurred by Batelco for conveying CPS calls through its network are already recovered by the CPS Call Origination charge (see charge item 2-13.8 in Schedule 3 of Batelco’s RO).\(^{32}\)

422. For the above reason, the Authority orders Batelco to remove the CPS cost recovery surcharge (see charge item 2-13.8 in Schedule 3 of Batelco’s RO).

Q28. Do you have any comments in relation to the Authority’s review of the other wholesale services (emergency call access, DQ assistance, inter-operator transit, and CPS services)? Please explain and justify your position.

---

\(^{32}\) The Authority has reviewed the cost drivers and cost allocation destinations documented in Batelco’s 2014 APM and has not identified any costs incurred for the provision of CPS calls other than the cost elements already included in the CPS Call Origination cost stack.
SUMMARY OF SUBMISSIONS ON SECTION 10

423. In this subsection, the Authority will add a summary of the submissions and cross-submissions (if any) received from stakeholders on section 10 (Review of other wholesale services).

THE AUTHORITY’S FINAL CONCLUSIONS ON SECTION 10

424. In this subsection, the Authority will provide its final views and conclusions with regard to section 10 (Review of other wholesale services).
11 Review of the duct access product

CONSULTATION TEXT

425. The Authority has started the review of the regulated duct access product and will conduct such review as part of a separate process. The review of the duct access product and service terms is thus not being covered in this RO draft Order.

Q29. Do you have any comments in relation to the Authority’s decision to review the duct access product as part of a separate proceeding? Please explain and justify your position.

SUMMARY OF SUBMISSIONS ON SECTION 11

426. In this subsection, the Authority will add a summary of the submissions and cross-submissions (if any) received from stakeholders on section 11 (Review of the duct access product).

THE AUTHORITY’S FINAL CONCLUSIONS ON SECTION 11

427. In this subsection, the Authority will provide its final views and conclusions with regard to section 11 (Review of the duct access product).

---

33 The Authority has initiated the review of the duct access product in August 2015 by requesting information on pending Service Request for duct access. OLOs and Batelco have since submitted information which is currently being analyzed by the Authority.
12 Other concerns related to Batelco’s RO

CONSULTATION TEXT

428. The Authority has included the above heading in this draft Order to allow respondents to raise any other concerns they may have on Batelco’s RO.

Q30. Do you have any other additional comments with regard Batelco’s RO? Please explain and justify your position.

SUMMARY OF SUBMISSIONS ON SECTION 12

429. In this subsection, the Authority will add a summary of the submissions and cross-submissions (if any) received from stakeholders on section 12 (Other concerns related to Batelco’s RO).

THE AUTHORITY’S FINAL CONCLUSIONS ON SECTION 12

430. In this subsection, the Authority will provide its final views and conclusions with regard to section 12 (Other concerns related to Batelco’s RO)
Annex B – Regulatory activities carried-out in 2014 and 2015 impacting this RO review

431. During the course of 2014 and 2015, the Authority has initiated or finalised several activities which are described in the following sections. The Authority has taken into considerations the outcomes of such activities during its review of Batelco’s RO submission.

432. In the following subsections, the Authority provides a summary of each of those regulatory activities and indicate how each one has influenced this review of Batelco’s RO.

B.1 Bottom-up cost models (2012-2014)

433. The Authority has finalised the fixed access network, fixed core network and mobile network bottom-up (“BU”) cost models in the first part of 2014. The final versions of BU models and documentations have been issued to Batelco, Viva and Zain on 15 May 2014.

434. The review of Batelco’s 2014 RO submission is no longer based on a single source of costing information, i.e. Batelco’s 2012 regulatory accounts. The Authority can now also take into account the results of the BU models.

435. The main assumptions and parameters of the BU models were extensively discussed with operators during the data collection and validation phases of the BU models project. Several meetings and conference calls took place to ensure that the dimensioning rules and input parameters were appropriately implemented in the BU models. The draft BU models were issued for consultation and the various comments received by operators were taken into account, resulting in final adjustments being made to the final BU models.

436. The final models have since been subject to on-going updates by the Authority to reflect the latest information available on the number of subscriptions and service usage. When necessary, the forecast demand included in the BU models has been adjusted by the Authority.

437. In this review of Batelco’s RO, the Authority has used the results of the core network BU model to derive a cost trend that has then been applied to the unit cost of MPLS and SDH transmission networks. For more information, you can refer to section 6 above (Review of the price terms applicable to the WLA and WDC products and services).

B.2 Broadband market review (2013-2014)

438. On 27 March 2014, the Authority published the final “Determination of Significant Market Power and Determination of Dominant Position in the Markets for Provision of Broadband Internet Access Services from a Fixed Location” (ref: MCD/03/14/018) which concluded its review of the broadband markets.

439. In the Determinations, the Authority identified and defined the following relevant retail and wholesale markets:
a. Retail markets:
   i. the retail market for the supply of mass-market broadband internet access services from a fixed location, in which the Authority determines that no licensees has a Position of Significant Market Power; and
   ii. the retail market for the supply of business broadband internet access services from a fixed location, in which the Authority determines that Batelco has a Position of Significant Market Power.

b. Wholesale markets:
   i. the wholesale physical network infrastructure access market for the supply of mass-market broadband internet access services from a fixed location, in which the Authority determines that no licensees holds a Dominant Position;
   ii. the wholesale physical network infrastructure access market for the supply of business broadband internet access services from a fixed location, in which the Authority determines that Batelco holds a Dominant Position;
   iii. the wholesale broadband access market for the supply of mass-market broadband internet access services from a fixed location, in which the Authority determines that no licensees holds a Dominant Position; and
   iv. the wholesale broadband access market for the supply of business broadband internet access services from a fixed location, in which the Authority determines that Batelco holds a Dominant Position.

440. As part of the broadband market review, the Authority also stressed the importance of fit-for-purpose wholesale access services in supporting competition in the downstream retail market for the supply of business broadband services:

"489. Given the importance of wholesale access services in supporting competition in the downstream retail market for the supply of business broadband services, the Authority expects that these wholesale access services, independent of the underlying infrastructure, are made available to OLOs on terms that enable competitors to compete with Batelco in the relevant retail markets.

490. These terms must include comprehensive Service Level Agreements (SLAs) which include all relevant processes and targets relating to the delivery of business broadband services, including (but not necessarily limited to) ordering, provisioning, quality of service, and fault restoration processes, as well as penalties to be imposed upon Batelco for failing to adhere to these processes or targets. The Authority emphasises that under Article 57(e) of the Telecommunications Law, the terms and conditions and tariffs offered by Batelco for access to its networks shall be fair, reasonable, and non-discriminatory.

491. In this regard, the Authority intends to issue a Draft Order for consultation with interested parties. The Draft Order will cover the non-price terms and conditions on which Batelco must offer its Bitstream service in respect of business broadband services. This will include the Authority’s preliminary views on appropriate
Draft Order on the Reference Offer of Batelco
Annex B – Regulatory activities carried out in 2014 and 2015 impacting this RO review

"performance thresholds and penalties for key processes such as those mentioned in the preceding paragraph."

441. In this review of Batelco’s RO, the Authority proposes several amendments to the non-price terms applicable to the Bitstream product that take into account the findings of the broadband market review. As part of this review of Batelco’s RO. Such amendments include the introduction of binding Service Levels. For more information, you can refer to section 7 above (Review of the non-price terms applicable to the Bitstream product and services).

B.3 Domestic data connectivity market review (2013-2014)

442. On 10 April 2014, the Authority published the final “Determination of Significant Market Power and Determination of Dominant Position in the Markets for Domestic Data Connectivity Services” (ref: MCD/04/14/026) which concluded its review of the domestic data connectivity markets.

443. In the Determinations, the Authority identified and defined the following relevant retail and wholesale markets:
   a. the retail market for the supply of domestic data connectivity services in Bahrain, with the exception of Amwaj Islands, in which the Authority determines that Batelco has a Position of Significant Market Power.
   b. the wholesale market for the supply of domestic data connectivity services in Bahrain, with the exception of Amwaj Islands, in which the Authority determines that Batelco holds a Dominant Position.

444. As part of the domestic data connectivity market review, the Authority also stressed the importance of fit-for-purpose wholesale access products and services in supporting competition in the downstream retail market for the supply of domestic data connectivity services. In that regard, the Authority refers to the last section of the Reasoning for the Final Determination (i.e. section 8: Summary of final views and implications) which details the changes to the wholesale access products and services that the Authority considers would be required to ensure a sustaining effective competition in the relevant downstream markets. Such changes notably include:
   a. the introduction and/or enhancement of comprehensive end-to-end Service Levels covering service ordering, provisioning, and fault restoration;
   b. the introduction of optional levels of protections;
   c. the potential introduction of a regulated dark fibre product; and
   d. the support of synchronisation by wholesale data connection products for wireless site backhauling.

445. In this review of Batelco’s RO, the Authority proposes the following changes which take into account the findings of the domestic data connectivity market review:
   a. the grouping of the existing high-speed CAT and LLCO services under a single service description called “Wholesale Data Connection” (“WDC”);
   b. the introduction of additional WDC speeds, offering higher speeds up to 10 Gbit/s;
c. the proposed introduction of limitations on the amount of costs that Batelco should recover for the expansion of its fibre access network through one-off charge based time and material;

d. the creation of a database for OLO’s to check fibre access coverage and availability, and in the interim, a pre-sale process to obtain the same information;

e. the review of the non-price terms applicable to the WLA and WDC products and services including the introduction of binding Service Levels and the payment of automatic rebates;

f. the introduction of an option for end-to-end physical and logical protection;

g. the introduction of a ‘Premium Support’; and

h. the introduction of lower regulated recurring charges for the WLA and WDC products and services.


446. Throughout the second half of 2014, the Authority has been undertaking a comprehensive strategic market review (‘SMR’) of the telecommunications sector in Bahrain and subsequently published the SMR draft report for consultation on 15 December 2014 (ref: 12/14/127).

447. The responses submitted by the operators were reviewed and considered by the Authority to produce the final SMR report (ref: MCD/08/15/062) and the External Response Document (ref: MCD/08/15/063) which were both published on 31 August 2015.

448. The purpose of the SMR report is to review how competition has developed across the telecommunications sector in Bahrain with a view to ensuring that the regulatory framework is adapted to reflect the recent market and technological developments.

449. The SMR report confirms that significant competition has developed in Bahrain in the last years, notably for broadband and mobile services. Consumers in Bahrain have today, in general, a wide range of choices for telecommunications services. The development of effective competition in particular markets has led to substantial price reductions and new service innovations for consumers and businesses in Bahrain.

450. In the SMR report, the Authority has identified a number of markets which are likely to be susceptible to ex-ante regulation going forward. Importantly, as competition develops, the Authority also proposes to remove some currently regulated retail markets from ex-ante regulatory scrutiny. The proposed changes to the list of relevant markets is summarized in the below table.
Draft Order on the Reference Offer of Batelco
Annex B – Regulatory activities carried-out in 2014 and 2015 impacting this RO review

Figure 41: Relevant retail and wholesale markets susceptible to future ex-ante regulation

<table>
<thead>
<tr>
<th>Retail markets</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Withdrawn</strong></td>
<td>• Retail market for dial-up internet access services from a fixed location&lt;br&gt;• Retail market for fixed narrowband access services for residential customers&lt;br&gt;• Retail market for fixed originated domestic calls for residential customers to either fixed or mobile subscribers within the Kingdom of Bahrain&lt;br&gt;• Retail market for fixed originated international calls to Zone 1 countries&lt;br&gt;• Retail market for fixed originated international calls to Zone 3 countries</td>
</tr>
<tr>
<td><strong>Maintained</strong> 34</td>
<td>• Retail broadband internet access from a fixed location for business users&lt;br&gt;• Retail domestic data connectivity services&lt;br&gt;• Retail international leased lines (connectivity services)</td>
</tr>
<tr>
<td><strong>Redefine</strong></td>
<td>Currently:&lt;br&gt;• Retail market for fixed narrowband access services for non-residential customers&lt;br&gt;• Retail market for fixed originated domestic calls for non-residential customers to either fixed or mobile subscribers within the Kingdom of Bahrain</td>
</tr>
<tr>
<td><strong>Proposed</strong></td>
<td>• Retail market for premium 35 access to call services and domestic calls from a fixed location</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Wholesale markets</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Withdrawn</strong></td>
<td>• “Freephone originating access” 36 (wholesale call origination)</td>
</tr>
<tr>
<td><strong>Maintained</strong></td>
<td>• Wholesale domestic data connectivity services&lt;br&gt;• Wholesale broadband access for business users&lt;br&gt;• Wholesale physical infrastructure access for business users</td>
</tr>
<tr>
<td><strong>Redefine</strong></td>
<td>Currently:&lt;br&gt;• Call termination on Batelco’s fixed network&lt;br&gt;• Wholesale market for termination services on Batelco mobile network, on Zain mobile network and on Viva mobile network</td>
</tr>
<tr>
<td><strong>Proposed</strong></td>
<td>• Wholesale call termination on individual fixed networks&lt;br&gt;• Wholesale call termination on individual mobile networks</td>
</tr>
</tbody>
</table>

Source: the Authority's draft Strategic Market Review report issued on 15 December 2014 (ref: 12/14/127)

34 However, the stated retail markets should only be maintained on the list until such point where proportionate but effective (market-tested) wholesale remedies are available in the relevant upstream market(s).

35 Premium access includes ISDN type products, and IP-based solutions serving business users with demand for multiple channels and lines but excludes standard business subscriptions such as PSTN or fixed-wireless.

36 However, noting that this wholesale product was never based on a dominance determination and remedy was never enforced by the Authority.
B.5 Regulation of Wholesale International Inbound Call Services and Review of Call Termination Rates (2015)

451. On 23 April 2015, the Authority issued a consultation titled “Regulation of Wholesale International Inbound Call Services and Review of Call Termination Rates" (ref: MCD/04/15/022). In the consultation document, the Authority proposes to review the current regulatory treatment of international inbound traffic and to introduce lower call termination rates in respect of domestically originated calls through a price glide path.

452. The Authority invited all interested parties to submit a response to the consultation no later than 28 May 2015. After due consideration of the operators’ submissions, the Authority issued its final decision in September 2015.

453. The final decision consists of two documents:

a. The Resolution No14 of 2015 which was published on 14 September in the Official Gazette. This resolution repeals the Regulation on Wholesale International Inbound Telecommunications Services as of 1 October 2015 (i.e. no more price floors applicable to the wholesale international inbound call services); and

b. The Reference Offer Orders on Batelco, Viva and Zain setting the regulated call termination rates which were issued on 17 September 2015 (ref: MCD/09/15/067). The Reference Offer Orders introduce as of 1 October 2015:

   i. higher call termination charges for internationally originated calls to Batelco fixed and mobile network, Viva mobile network and Zain mobile network; and

   ii. lower call termination charges through a three-year price glide path for domestically originated calls to Batelco fixed and mobile network, Viva mobile network and Zain mobile network.

454. The applicable call termination rates from 1 October 2015 and onwards are summarized in the below table:
Figure 42: Regulated call termination rates from 15 September 2015 and onwards

<table>
<thead>
<tr>
<th>Mobile termination rate for domestically originated calls i.e. with Bahrain CLI (in fils per minute, chargeable per second)</th>
<th>From: 1 October 2015 To: 30 September 2016</th>
<th>From: 1 October 2016 To: 30 September 2017</th>
<th>From: 1 October 2017 onwards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobile termination rate</td>
<td>4.50</td>
<td>3.30</td>
<td>2.40</td>
</tr>
<tr>
<td>Mobile termination rate for internationally originated calls or for originated calls with absent or unclear CLI (in fils per minute, chargeable per second)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mobile termination rate</td>
<td>37.68</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fixed termination rate for domestically originated calls i.e. with Bahrain CLI (in fils per minute, chargeable per second)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fixed termination rate</td>
<td>1.92</td>
<td>1.38</td>
<td>1.02</td>
</tr>
<tr>
<td>Fixed termination rate for internationally originated calls or for originated calls with absent or unclear CLI</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fixed termination rate</td>
<td>30.12</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: the Authority, see “Reference Offer Orders on Bahrain Telecommunications Company B.S.C., Viva Bahrain B.S.C, and Zain Bahrain B.S.C. setting the regulated call termination rates” issued 17 September 2015 (ref: MCD/09/15/067)

455. Accordingly, the review of the call termination rates to Batelco’s fixed and mobile lines is not covered in this document.
## Annex C – List of acronyms and definitions

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADSL</td>
<td>Asymmetric Digital Subscriber Line</td>
</tr>
<tr>
<td>APM</td>
<td>Accounting Procedures Manual</td>
</tr>
<tr>
<td>Batelco</td>
<td>Bahrain Telecommunications Company B.S.C</td>
</tr>
<tr>
<td>BB</td>
<td>Broadband</td>
</tr>
<tr>
<td>BD</td>
<td>Bahraini Dinar</td>
</tr>
<tr>
<td>BU</td>
<td>Bottom-up</td>
</tr>
<tr>
<td>CAPEX</td>
<td>CAPital EXPenditure</td>
</tr>
<tr>
<td>CAT</td>
<td>Customer Access Tail</td>
</tr>
<tr>
<td>CSI</td>
<td>Customer Sited Interconnect</td>
</tr>
<tr>
<td>DSL</td>
<td>Digital Subscriber Line</td>
</tr>
<tr>
<td>DWDM</td>
<td>Dense Wavelength-Division Multiplexing</td>
</tr>
<tr>
<td>FAC</td>
<td>Fully Allocated Cost</td>
</tr>
<tr>
<td>FRO</td>
<td>Forum on Batelco’s Reference Offer</td>
</tr>
<tr>
<td>GbE</td>
<td>Gigabit Ethernet</td>
</tr>
<tr>
<td>Gbit/s or Gbps</td>
<td>Gigabits per second</td>
</tr>
<tr>
<td>GPON</td>
<td>Gigabit Passive Optical Network</td>
</tr>
<tr>
<td>ISC</td>
<td>Interconnect Specific Charge</td>
</tr>
<tr>
<td>ISI</td>
<td>In-Span Interconnect</td>
</tr>
<tr>
<td>kbps or kbit/s</td>
<td>Kilobits per second</td>
</tr>
<tr>
<td>LLCO</td>
<td>Local Leased Circuit for OLO</td>
</tr>
<tr>
<td>LLU</td>
<td>Local Loop Unbundling</td>
</tr>
<tr>
<td>LRIC</td>
<td>Long Run Incremental Cost</td>
</tr>
<tr>
<td>MB</td>
<td>Megabytes</td>
</tr>
<tr>
<td>Mbps or Mbit/s</td>
<td>Megabits per second</td>
</tr>
<tr>
<td>MPLS</td>
<td>Multiprotocol Label Switching</td>
</tr>
<tr>
<td>MRC</td>
<td>Monthly Recurring Charge</td>
</tr>
<tr>
<td>MSAN</td>
<td>Multi-Service Access Node</td>
</tr>
<tr>
<td>NA</td>
<td>Network Activity</td>
</tr>
<tr>
<td>NB</td>
<td>Narrowband</td>
</tr>
<tr>
<td>NGN</td>
<td>Next Generation Network</td>
</tr>
<tr>
<td>NRA</td>
<td>National Regulator Agency</td>
</tr>
<tr>
<td>NRC</td>
<td>Non-Recurring Charge</td>
</tr>
<tr>
<td>OLO</td>
<td>Other Licensed Operator</td>
</tr>
<tr>
<td>OLT</td>
<td>Optical Line Terminal</td>
</tr>
<tr>
<td>ONT</td>
<td>Optical Network Terminal</td>
</tr>
<tr>
<td>PE</td>
<td>Provider Edge</td>
</tr>
<tr>
<td>POP</td>
<td>Point Of Presence</td>
</tr>
<tr>
<td>RAN</td>
<td>Radio Access Network</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Definition</td>
</tr>
<tr>
<td>--------------</td>
<td>------------</td>
</tr>
<tr>
<td>RO</td>
<td>Reference Offer</td>
</tr>
<tr>
<td>SDH</td>
<td>Synchronous Digital Hierarchy</td>
</tr>
<tr>
<td>SHDSL</td>
<td>Symmetrical High-speed Digital Subscriber Line</td>
</tr>
<tr>
<td>TD</td>
<td>Top down</td>
</tr>
<tr>
<td>TRA</td>
<td>Telecommunications Regulatory Authority of the Kingdom of Bahrain</td>
</tr>
<tr>
<td>WACC</td>
<td>Weighted Average Cost of Capital</td>
</tr>
<tr>
<td>WDC</td>
<td>Wholesale Data Connection</td>
</tr>
<tr>
<td>WDSL</td>
<td>Wholesale Digital Subscriber Line</td>
</tr>
<tr>
<td>WLA</td>
<td>Wholesale Local Access</td>
</tr>
<tr>
<td>WOBS</td>
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</tr>
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Q1. Please provide any comments you may have in relation to the Authority’s premise of fair, reasonable and non-discriminatory terms, conditions and tariffs for regulated RO products and services.

Q2. Do you agree with the Authority’s proposed general amendments to be made to Batelco’s RO? Please explain your position. If you disagree, please propose an alternative.

Q3. Do you agree with the Authority’s proposal to mandate the introduction of Service Levels for the Wholesale Data Connection and the Bitstream products and services? Please explain and justify your position.

Q4. Do you agree with the Authority’s proposed definition and description of the service request process? Please explain and justify your position.

Q5. Do you agree with the Authority’s proposed definition and description of the service delivery process? Do you agree with the proposed provisions that the Authority considers should apply in case an OLO cancels a Service Request during the delivery process? Please explain and justify your position.

Q6. Do you agree with the Authority’s proposed definition and description of the fault management process? Please explain your position.

Q7. Do you agree with the Authority’s proposed process for the payment of Service Level Penalties? Do you agree that the corresponding rebate(s) shall not be claimed by OLOs but directly reflected by Batelco in the next invoice(s)? Please explain and justify your position.

Q8. Do you have any comments on the Service Level definitions proposed by the Authority? Please explain and justify your position.

Q9. Do you agree with the Authority’s proposed creation of a Forum on Batelco’s RO? Please explain and justify your position. According to you, what should be the terms of reference of such forum to ensure its effectiveness?

Q10. Do you agree with the Authority’s proposed approach aiming at limiting the payment of one-off charges for the deployment of a fibre access? Please explain and justify your position.

Q11. Do you agree with the Authority’s proposal to order Batelco to build a centralised database on fibre access and fibre usage in Bahrain? Do you agree that until such time as a database is made available, Batelco should introduce a 2-working-day presale process? Please explain and justify your position.

Q12. Do you have any comments in relation to the speeds for which the WDC should be made available?

Q13. Do you have any comments in relation to the proposed technical characteristics for the WLA and WDC Aggregation Links?

Q14. Would you be interested by the introduction of a synchronisation feature for the WLA? Please explain and justify you position.
Q15. Do you agree that Batelco should offer as an option the full end-to-end physical and logical protection of a WLA or WDC Connection for an additional 30% mark-up on top of the applicable MRC? Please explain and justify your position.

Q16. Do you agree that Batelco should allow the use of a second ingress ports on a CPE provided for a WLA/WDC Connection or a WLA/WDC Aggregation Link? Please explain and justify your position.

Q17. Do you agree that Batelco should provide a minimum set of information on CPEs used for WLA and WDC Aggregation Links and Connections? Please explain and justify your position.

Q18. Do you agree that Batelco should continue to be subject to additional QoS reporting obligations for WLA and WDC? Please explain and justify your position.

Q19. Do you agree that Batelco should implement a test based on ITU-T Y.1564 test methodology and systematically provide a copy of test results to the OLO? Please explain and justify your position.

Q20. Do you agree that OLOs should have access to Batelco’s BNV system? Should OLO’s customers (i.e. end-users) also have access to such system? Please explain and justify your position.

Q21. Do you agree that penalties should be paid on a per fault basis for failure to meet a maximum restoration time rather than based on percentage of service availability? Explain and justify your position.

Q22. Do you agree with the Authority’s proposed introduction of a ‘Premium Support’ service for an additional 20% premium on top of the applicable MRC? Please explain and justify your position.

Q23. Do you agree with the Authority’s proposed Service Level Terms and Penalties for the WLA and WDC products and services. Please explain and justify your position.

Q24. Do you agree with the Authority’s proposed modifications of the Bitstream service description? Please explain and justify your position.

Q25. Do you agree with the Authority’s proposed Service Level Terms and Penalties for the business Bitstream product and services. Please explain and justify your position.

Q26. Do you agree with the Authority’s proposal to freeze the charges applicable to the business Bitstream and business WDSL? Please explain and justify your position.

Q27. Do you agree with the Authority’s proposal to freeze the charges applicable to the ISI and CSI link services? Please explain and justify your position.

Q28. Do you have any comments in relation to the Authority’s review of the other wholesale services (emergency call access, DQ assistance, inter-operator transit, and CPS services)? Please explain and justify your position.

Q29. Do you have any comments in relation to the Authority’s decision to review the duct access product as part of a separate proceeding? Please explain and justify your position.

Q30. Do you have any other additional comments with regard Batelco’s RO? Please explain and justify your position.