C&W Cayman Islands Response to ICTA/Telcordia Round 2 LRIC Interrogatories [Part 2 May 25 submission]

2.1.6   In section 2.2 of C&W's response to ICTA/Telcordia interrogatories, C&W provided a table derived from using the "Reconciliation" sheet in the Consolidation Model detailing the Pure LRIC in the first column, ISFC (FCCs/Joint Costs as per the specialized literature) in the second and third columns and FCCs (Network-Wide Common Costs as per the specialized literature) in the fourth column for the fixed network.

   a.   Please explain how C&W derived that table from the Reconciliation sheet of the Consolidation Model.

C&W Response

The table was derived from the reconciliation sheet by setting the "Calculation Type" to "(All)". We then sequentially set the "Mark-up Type" to "LRIC without Mark-up", "G-Fixed Access", "G-Fixed Traffic", "BU-F-Common Variable" and "(All)". At each mark-up scenario, we summed the annualized cost, the opex and the overhead opex for each of the fixed network 900-service total lines. We note that the objective of this exercise was to illustrate the equi-proportional mark-up. The costs here related to network elements, thus the "Fully-loaded LRIC" in this table will not be equal to the total service costs.

   b.   Please explain whether the column on Fully Loaded LRIC (in the last/fifth column) already includes the TD Common Costs.

C&W Response

The fully loaded LRIC by network element as given in the fifth column does not include non-network costs.

   c.   Does the Reconciliation sheet in the Consolidation Model also calculate and provide information about the TD Common Cost? If yes, please explain how. If no, explain where that information on TD Common Cost can be found.

C&W Response

The fully loaded LRIC by network element as given in the fifth column does not include non-network costs. Information on TD Common Cost can be found in the RET_VAL sheet.

   d.   Please provide another table including an additional column detailing the TD Common Costs.

C&W Response

This interrogatory seems to be seeking to have all the mark-ups displayed on a service level basis. As TD Common Costs are not added to network elements, but to services, it would not be logical to add a TD Common Cost to the column that was presented in our response to 2.2 of the

Round 2 Telcordia Interrogs Responses Part 2

REDACTED VERSION

interrogatories.   What we do here instead, and to more fully respond to interrogatory 5.1.6g, is to derive both network and non-network pure LRIC and mark-ups for a sample service. In this case, we choose PSTN Access Res. The results are given in the Table below. Please note that we use the model revised as per Interrogatory 3.1 to generate the results in the table.

First, note that in respect of network costs, we can see from the routing factors in column V of the "Fixed Services Cost" sheet that the only relevant elements in the network cost are RSU-line sensitive and the access local loop.   To derive the network costs in this exercise, we choose the ABS_VAL sheet. We set "Mark-up Type" to "LRIC without Mark-up" and pull off the annualized capital cost, network opex and overhead opex for the two network elements concerned. These are found in Rows (a) and (f) in the table below. We then set the "Mark-up Type" sequentially to the two Fixed/Joint Cost categories—Fixed Traffic and Fixed Access—and the Network-wide "BU: F Common Variable", each time pulling off the appropriate figures to go into Rows (a) and (f). Note that, for simplicity's sake, we have not broken down the fixed/joint cost and network wide common in annualized cost, opex and overhead opex, but that can be done.   Also, please note that the sum of the elements of row (a) and row (f) equal the total network cost in D7 and D8 of the Fixed Network Cost sheet, respectively (as well as B11 and B12 of the Fixed Service Cost Sheet).

In order to assign these costs to the PSTN Access Res service, we make use of the routing factors. First, we get the unit costs of each relevant network elements by cost type. This is in rows (c) and (h) respectively for RSU line sensitive and the access local loop. The unit costs are derived with the total volumes using the network element. These volumes can be found in column E of the "Fixed Network Cost" sheet.   We then multiply the unit cost by the volumes associated with the PSTN Access Res service to arrive at the total cost by cost type for the service. This is given in rows (e) and (j). By summing rows (e) and (j) we get the total network costs by cost type for the service, which appear in row (k). Please note that the sum total in row (k) equals the total network costs of the PSTN access Res service in cell V42 of the "Fixed Service Cost" sheet.

In order to get the retail costs, we must switch to the RET_VAL sheet. Here we simply sequentially choose the retail cost types—in this case, "LRIC without mark-up", "G-Fixed Access" and "TD-Common Variable"—and pick out the figures for the PSTN Access Res service.   Please note the sum total of these costs in row (l) equal the total retail cost found in cell V46 of the "Fixed Service Cost" sheet.

#

	RF Volumes	Network						
		Pure LRIC			Fixed/Joint Costs			
		Annualized Capital Costs	Network Opex	Overhead Opex	Fixed Traffic	Fixed Access	Network Wide	Total
(a) 400-RSU line sensitive		###	###	###	###	###	###	###
(b) Total Volumes	21580							
(c) Unit Costs		###	###	###	###	###	###	###
(d) PSTN ACCESS RES vol	13500							
(e) PSTN ACCESS RES- RSU line sensitive		###	###	###	###	###	###	###
(f) 400-Access Local Loop		###	###	###	###	###	###	###
(g) Total Volumes	22660							
(h) Unit Costs		###	###	###	###	###	###	###
(i) PSTN ACCESS RES vol	13500							
(j) PSTN ACCESS RES- Local Loop		###	###	###	###	###	###	###
(k) Total Network Costs		###	###	###	###	###	###	###

	Retail			
	Pure LRIC	Fixed Access	TD-Common	Total
(l) PSTN ACCESS RES- Retail	###	###	###	###

\#

2.1.7   In the abovementioned table there appear to be some calculation errors, since the Fully Loaded LRIC is not equal to the sum of the Pure LRIC and the respective mark ups for FCCs/Joint Costs and Network-Wide Common Costs for some of the lines in that table.

a.   Please revise/correct the numbers in this table.

C&W Response

Please find a revised table below. Note this data is based on the March 10 model.

	Pure LRIC	Fixed Model ISFC-Traffic (Mark-up over Pure LRIC=1700%)	Fixed Model ISFC-Access (Mark-up over Pure LRIC= 194%	Fixed Model FCC Mark-up over Pure LRIC + ISFC=44%)	Fully loaded LRIC^
900-ADSL RETAIL	###	N.A.	###	###	###
900-ADSL WHOLESALE	###	N.A.	###	###	###
900-DOMESTIC LEASED CIRCUITS RETAIL	###	###	N.A.	###	###
900-DOMESTIC LEASED CIRCUITS WHOLESALE	###	###	N.A.	###	###
900-DOMESTIC TRANSIT	###	###	N.A.	###	###
900-FIXED CALL TO C&W	###	###	N.A.	###	###

Round 2 Telcordia Interrogs Responses Part 2

REDACTED VERSION

MOBILE					
900-FIXED CALL to OLO	###	###	N.A.	###	###
900-FIXED CALL TO OTHER MOBILE	###	###	N.A.	###	###
900-FIXED INTERNATIONAL INCOMING	###	###	N.A.	###	###
900-INTERNATIONAL TRANSIT to OLO	###	###	N.A.	###	###
900-NATIONAL PAYPHONE	###	###	N.A.	###	###
900-PSTN ACCESS BUS	###	N.A.	###	###	###
900-PSTN ACCESS RES	###	N.A.	###	###	###

b. Please provide a similar table detailing the Pure LRIC, ISFC (FCCs/Joint Costs as per the specialized literature), FCCs (Network-Wide Common Costs as per the specialized literature) and TD Common Costs for both the <u>fixed and mobile network</u>.

C&W Response

Please see our response to 2.1.6 above. Please confirm that what is requested is conducting for all services the exercise we have done for PSTN Access Res in our response above.

c. Please also show the total (actual) values of FCCs/Joint Costs for each Group Increment (Fixed-Access; Fixed-Traffic; Mobile-Subscriber; Mobile-Traffic), total (actual) values of the Network-Wide Common Costs (both for the fixed and mobile networks) and the total (actual) value of TD Common Costs.

C&W Response

Please see our response to 2.1.6 above. Please confirm that what is requested is conducting for all services the exercise we have done for PSTN Access Res in our response above.

2.4.3 In C&W's response to question 2 of section 3.10 of ICTA/Telcordia interrogatories, C&W states that "the jury is still out on the balance of expense savings in the transition to

NGN", implying that in the transition from PSTN to NGN there may be some cost savings and some cost additions, so that the balance is still unclear.

a. Please provide C&W's best effort estimate of the cost savings and cost additions (to the respective expense factors and non-network cost categories), instead of assuming the balance will be "zero".

C&W Response

First of all, it is important to note that, because expense factors are stated in terms of percentages of capital costs, all reductions in capex will inherently capture an expense reduction. In that sense, we did not properly represent the case for network opex: the balance is not zero, but decreasing in step with capex figures.

Secondly, on reviewing the network expense categories, we do find there would be economies among a couple of the service and platform provision and support. In particular, "maintaining internet service equipment" and "provide internet services" may be inappropriate given that the entire network is "going IP". There are several ways we could treat this. We would propose to simply eliminate these cost entries.

There are two significant exceptions to this general expectation of reduction in network expense reductions:

1) We have found an increase in electricity consumption associated with the migration to NGN facilities. We use about 64% more power on a KwH basis (even more on a monetary basis). This is due to the fact that both the power consumption of the new systems is greater and, as a result of the increased power consumption, the heat generated is greater, thus resulting in significantly higher A/C cooling requirements.

2) Support costs for the NGN switch and IP platform has risen by three times (this specifically covers for maintenance issues, hardware repairs, software updates/patches for maintenance and new software upgrades which contain new functionality). Thus, under the expense factor for "provide operational support systems" for the RSU, Host Switch, IP Equipment and Data Network Equipment in our previous submissions, these costs total only an annual $###k. This is total now is in the region of $###k.

We also should mention that, although this interrogatory deals with the fixed network, there are some additional cost savings that we can expect on the mobile network. Our expense factors have embedded some TDMA costs. These should be excluded in anticipation of the total closure of that system. In particular, this will result in a ceasing of a $###k annual support contract with Ericsson. There is also an anticipated power (to the TDMA switch and BTSs) reduction of $###k per year. Finally, the closure of the TDMA network permits elimination of a TDMA roaming circuit (a 56k signaling link to the US to permit and support TDMA roaming) costing around ###k annually.

With respect to the non-network expenses, we note that, as these amounts are not applied as percentages as is the case with expense factors, they are not subject to the inherent reduction as is the case with network opex. As we noted in our response to interrogatory 2.1.8, we propose a 4.8% reduction in fixed and mobile non-network costs. ###

b. Please comment on the potential cost savings coming from:

Round 2 Telcordia Interrogs Responses Part 2

REDACTED VERSION

i. Having one single fixed network to maintain and manage (instead of different networks for voice and data services).

C&W Response

We agree there will be savings in network opex of the type described here. It is difficult to get an totally accurate reading from C&W Cayman's experience as it is in the middle of migration. Moreover, as with most networks involved in this transition, at the end of the NGN project we still will not have a 100% fully converged, IP network (the existence of the media gateways at the access nodes testify to that.) However, in general, we believe that it is reasonable to assume that the opex reductions will be generally in line with the capex reductions, which is what the expense factors do. Please see our response to Interrogatory 2.4.3a above.

ii. Reduction in the number of routes to be maintained and reduction in the number of access nodes.

First, we emphasize that as a small operator, C&W Cayman could never hope to achieve the kinds of rationalization that might be available to larger networks. This is a point we have made before in other submissions in this proceeding. That said, the bottom-up modeling has taken into account reductions in the number of routes and nodes. In particular, we have eliminated two routes because the international gateway function is being absorbed into two call servers. So instead of two local switches, each with a route to the international gateway, we will only have two combined local/international switches.

With respect to the access nodes, we have eliminated a number of remote switches on the assumption of their replacement by MG9Ks. This is because each remote switch could provide ### line circuits whereas an MG9K can support up to ### line circuits. In the Georgetown switch location, for example, we are swapping out ### remotes with ### MG9Ks. Similarly, in West Bay, Seven Mile Beach & Spotts there were ### remotes each. All three of these sites now have ## ## each.

However, we note that, as the IP network is growing, we have had to bring the broadband platform closer to subscribers, which means establishing remote terminals closer to distant subscribers. For example, there are nine additional terminals being installed.   The incremental cost of adding remote terminal facilities is necessary to bridge the distance gap between acceptable signal strength and performance standards. And these RT facilities can be expensive considering the equipment, construction costs, fiber installation.

2.6.11 What Large telecommunications companies are included in the Large Co Stocks data from 1926 to 2004? Please provide a list by year of the telecommunication companies included in the data. What would the Average to 2004 for the Large Co Stocks be if only the telecommunication company data in the Ibbotson Associates data was used to develop the Average for 2004? What Large Co Stocks are included in the data for each and every year from 1926 to 2004?

C&W Response

Round 2 Telcordia Interrogs Responses Part 2

REDACTED VERSION

As indicated in our response to interrogatory 2.6.3, we do not believe that methodologically it makes any sense to measure equity risk premium by comparing telecom equity returns to risk-free returns. It would be highly unusual in the field of cost of capital measurement to do so.

Quite apart from this methodological inappropriateness, it will be very time-consuming to identify year-on-year the telco stocks within the Ibbotson sample and their returns for the time period required. Ibbotson does not provide this data, so we would have to research this from other sources. To be responsive, we have begun to carry out this work; however, we urge the Authority, to reconsider, having read our responses to the WACC-related interrogatories, whether such a study is truly necessary. We are still awaiting a response.

3.3.2   In the first round of interrogatories, ICTA asked if the engineered "Grade of Service" and "Quality of Service" associated with the IP network for the support of voice traffic are equivalent to that of the PSTN, as well as for C&W to detail what steps, if any, it has taken to achieve this goal and to validate that it has been met. C&W responded that C&W monitors overall peak traffic over all IP links and ensures there is enough capacity to carry peak traffic. To supplement this response, please provide validation that the QoS is equivalent to that of the PSTN.

C&W Response

C&W has provisioned adequate capacity to maintain its grade of service. By way of evidence we can give our latest indicators of service performance for our VOIP product vs. service carried on traditional circuit-switched basis. For VOIP, our call completion rate (CCR) overall is ###%. Post Dial Delay (PPD) was ### seconds on average to sampled international destinations. Those figures are good. For traditional circuit switching, although the PDD is at ### seconds, the CCR is worse, at ###%.

3.4.1   In the first round of interrogatories, C&W was asked to explain and justify the assumption on the "Technical Assumptions" worksheet of cell C15: Softswitch ratio of call-sensitive/duration-sensitive. In response, C&W noted that "the results of the LRIC models are posted on a per minute basis in any event, making such a split immaterial." Telcordia would agree that the split has little impact on total costs. However, changes to the assumption do have an impact on costs of network element categories and services. Please provide any basis for the 50 percent values used for this technical assumption. If there is no basis, please develop an estimate C&W can support with current or projected data and please provide any such data and derivation of the estimate.

C&W Response

The only approach C&W can think to suggest at this point is a usage-based approach. We could set the call sensitive vs. the duration sensitive switching shares in relation to the average call duration. This would be done in such a way as to equalize the "unit" network cost of the average call whether that unit was calculated on a per minute basis alone (as it is in the model now) or on a disaggregated per call and per minute basis. We propose to examine the call volumes and propose a breakdown in our submission on June 1.

3.4.3   In the first round interrogatories, C&W was asked to provide explanation and justification for the assumption on the "Technical Assumptions" worksheet of cell C21: Circuit Efficiency Factor. In response, C&W noted that the percentage of 66 percent used "represents a reasonable and conservative estimate of the level of utilization obtained for optical transmission systems, which may range between 65 percent and 75 percent." Please provide documentation for 66 percent as a reasonable and conservative estimate or for 65 percent and 75 percent as the range between which utilization is expected to vary.

C&W Response

Please find the attached utilization data in Appendix VII, which should that among domestic transmission network the utilization rate is actually around the ###% mark. Among international circuits it is closer to the ###% mark. It can be argued that the international circuits are more scaleable and represent a more efficient level of utilization. Therefore, we believe 65-66% is probably a reasonable number. Please note that this data is from 2004, i.e., gathered at the time of the initial construction of the model, but also at a time, pre-Ivan, when utilization on the national fixed network was higher than it has been post-hurricane.

3.6.2   In their response to interrogatories, C&W notes that "a consideration for spares has been included in the investment costs listed" for the fixed model. Please show how and where consideration for spares has been included in the investment costs listed.

C&W Response

It is standard practice for vendors to include in initial kit shipments required spares. These are often not broken out of the total. However, it is true that maintenance spares are delivered and separately invoiced over the lifetime of the facilities concerned. Thus, after the initial US$###m investment in NGN kit in 2003, our vendor delivered about ### in spares the following year. Similarly, in 2004 a total of US$###m of kit was purchased, a year later additional spares totaling $US###k. Finally, in 2005 the base kit delivery was US$###million. A year later US$###k in additional spares were delivered. C&W did not include these additional spares in its calculation. The cost of the additional spares was thus between 2-7% of the original investments.

3.7.1   The current state of long haul transmission technology allows the implementation of much higher capacity submarine systems – from 10 Gbps to multi-terabit. The use of estimates for an STM4 transmission system would tend to result in a higher cost per STM1 compared to a deployment based on a higher capacity transmission system. As a result, the representative STM4 deployment used in the analysis would tend to overestimate the international transmission per unit investment. Were other fiber configurations explored? Was the use of existing fiber routes with available bandwidth considered?

C&W Response

The fact that the model provisions an STM4 transmission system for carriage of international traffic does not mean that the capacity cost is based on a STM4 cable system. The international capacity in use by C&W Cayman uses capacity on a 10 GHz optical transmission system.

Obviously C&W Cayman, does not own the full 10 GHz capacity, but benefits from the pricing that results from being on that larger system. C&W Cayman is able to take advantage of 10 GHz pricing as it is a member of the Maya consortium, and as such the costs it faces on a per STM-1 unit cost basis is the same price for all members regardless of the quantity of STM-1's purchased.

3.8.1 In explaining the process for development of the routing factors used in the fixed model, C&W cited individual service analysis in collaboration with the C&W engineers as the basis for the factors. Please provide this analysis for each fixed service.

C&W Response

Observation of the route factor table in the "Routing Factor Input" sheet of the fixed network model reveals that some of the services carry routing factors 1 or 2. For example, ADSL Retail against the network element International Tx carries a routing factor of 1 in recognition of the fact that ADSL service being an IP based service must traverse the international transmission facilities, thus it has a factor of 1. This is to say that some routing factors were determined through having a thorough understanding of the network and how services are offered over the network.

There are other routing factors that are not that obvious, and, for example, for the call services an analysis of traffic patterns was conducted. The analysis did not cover all call services but in so far as traffic statistics were available to aid such an analysis one was done. For example, the routing factor for Fixed Call To C&W Mobile, row 16, column J above, carries a factor of 0.303 for the network element Host to Host Tx. This factor was determined through the traffic analysis study, see Appendix VI. In the Appendix sheet 'mins 04_05', range BL1593:BP1623, are the traffic sensitive factors determined for the Host to Host Tx network element. And cell BO1598 captures the factor (0.303) for the service Fixed Call To C&W Mobile (FTM).

The other traffic sensitive factors are capture along columns BL:BP starting from the lowest in row 1762 (National Submarine Tx) straight up to row 1085 - Host exchange.

Taking another example, say the Fixed International incoming and outgoing in rows 18 and 19 above and for the network element PSTN Host Switch – call sensitive, the factor carried is 1.180 and is shown in Appendix VI, sheet 'calls 04_05', range BL1083:BP1113, cell BO1100. All the Call sensitive factors are calculated along columns BL – BP.

In some cases a network average routing factor was used where traffic statistics were not obtained. For example, network element Host Switch – Duration Sensitive route factors for the services Emergency Service retail and Operator Assistance shown above in rows 14 and 30 respectively, carry a value of 1.04. This figure can be obtained in the 'mins 04_05' sheet, cell BR1109, an average of the Fixed Local (calls within an exchange) and Fixed Trunk (calls across two exchanges) calling statistics.

4.4.1 The Demand Assumptions tab shows a total of 30,000 mobile subscribers. The same number is being used to represent the number of Data and SMS subscribers (a cell label indicates that this number is used in the sizing of SMS and Data traffic). Although the

vast majority of mobile users do have SMS and/or data enabled handsets, only a fraction of them actually use these services. Please explain the assumption.

C&W Response

The number of SMS calls is not directly based on the number of mobile subscribers. The SMS traffic is based on actual SMS calls measured on the C&W network, but adjusted to the subscriber numbers. The formula by which we arrived at the hypothetical volume is a follows: actual number of SMS messages originated on the C&W network*### plus a 20% uplift for growth. Thus, the actual number of SMS messages was ## per year. The actual number of subscribers on the C&W network was ###. Therefore, the assumption of 6.6million calls is the result of (###m*30k/###k)*1.2.

4.4.2   In question 3.4.5 of the first round of interrogatories, C&W was asked to describe how C&W had accounted in its demand and traffic projections due to use of VoIP, for possible changes in fixed-mobile calling patterns or for mobile substitution? In its response, C&W noted that "we have accounted for an expansion of those types of fixed traffic where VOIP options are currently available, in particular in fixed-to-fixed national calling and international outbound and inbound calling. The fact that the mobile traffic is not assumed to be susceptible to that effect means implicitly that there is movement in relative terms in favour of fixed calling." However, we could not find any mention of the impact (potential erosion) of VoIP services from non-facilities based companies like Vonage, Skype and others in the near future. Neither did we see references to the estimated impact of fixed to mobile substitution (displacement of fixed line service in favor of mobile usage) in terms of traffic and/or line counts. Please elaborate on how these were addressed, if at all.

C&W Response

In both instances, there was an assumption that significant erosion in fixed volumes had already taken place and, of course, one of the prime reasons for a move to an IP platform is to stop or reverse the erosion in fixed-line volumes. That said, the base volume data upon which the modeled volumes were determined are now at least a year and a half out of date. The degree to which additional fixed-to-mobile substitution and erosion from non-facilities based companies continues or has been arrested could be better informed by a refreshed set of volume data.