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Anna Moodie
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16 August

Osmond Borthwick
Manager – Network Access
Commerce Commission
44-52 The Terrace
Wellington

Dear Osmond

TelstraClear Bitstream Workshop – Additional information request

1. We respond to the points addressed in the Commission's letter dated 3 August 2005.

Question 4(i) Telecom to provide underlying modelling assumptions on information corresponding to Dr Garth's simulations used for slides 10, 11 and 12.

2. Please find attached Dr Garth's response at Annex A.

Question 4(vii) Telecom to provide details of the Moves, Adds & Changes ("MACs") required within its network to change the average SIR if requested by TelstraClear.

3. The issue of averaging was discussed briefly at the July workshop on the second half of day 2 and is the first step to assessing whether a proposal for an averaged SIR is indeed workable within the framework in the Act. TelstraClear advised that it would be seeking an averaged target quarterly or six monthly[1].

4. Dr Milner noted that measurement of averages was a new requirement from TelstraClear and appeared to be a very expensive and difficult thing to do[2]. TelstraClear's technical advisers did not think it would be a difficult thing to do but did not explain how it might be done. Question 3(iii) is directed to TelstraClear to elaborate on this point by reference to Telstra.

5. If measurement of averages is workable then consideration must be given to the ability and the cost to implement an average SIR. Annex B details the process for changing the SIR for TelstraClear customers. As there is no

[1] Page 287 July workshop transcript
[2] Page 285 July workshop transcript

retail equivalent for this process, it is not possible to impute a price. Economic efficiency however indicates that a charge equal to at least the costs Telecom will incur in carrying out the process each time will need to be applied to TelstraClear.

Question 6(i) Telecom to provide information on the process where a customer is reassigned back from a commercial UBS service provided by a third party access seeker to a retail JetStream service.

6. At page 204 of the July workshop transcript Telecom stated that Telecom does not reassign UBS back to Telecom because Telecom does not offer a UBS product. The requisite transition would be from UBS to JetStream and we do not offer this via eOR for broadband – it is done manually. This means the process is slower and not comparable with the transition from JetStream to UBS. Annex C, "Winback UBS to JetStream on retail line", outlines the process for this to occur.

Question 6(ii) Telecom to confirm whether eOR for broadband test environment would be available

7. Telecom will have a test environment for the B2B part of eOR for Broadband (Online Order & Tracking). A test environment for the (current) Online part of eOr for Broadband is being investigated and will be implemented if necessary and feasible. We expect that as the functionality of the Online part of eOR for Broadband is extended a test environment will be included.

Question 6(iii) Telecom to provide eOR for broadband documentation

8. Please refer to attached document – "OOT User Guide 05Aug05"

Question 6(vi) Telecom to provide views on whether an independent facilitator/mediator/arbitrator in respect to OSS would be appropriate, and how such a mechanism would operate.

9. At paragraph 8(c) of TelstraClear's OSS paper provided at the July workshop TelstraClear proposes "*If disputes arise in relation to the design and implementation of the B2B solution, either party may refer the dispute to the Commission.*" The Commission asked whether the parties had a view as to whether the Commission or an independent facilitator would be a more appropriate vehicle if the Commission decided it was appropriate[3].

10. TelstraClear encourages the Commission to determine that an independent facilitator, mediator or arbitrator be employed to resolve OSS issues arising after and from the date of the final determination. TelstraClear stated that an independent facilitator would be more effective in dealing with low level disputes (as some of the detail the Commission might not want to get

[3] Page 268 July workshop transcript as referred to in this information request

involved in) and that it has the option to take higher level disputes to the Commission. These proposals raise two issues.

11. First, the Act provides a specific process by which a determination may be clarified or amended[4]. These are the processes provided by Parliament to revert back to the Commission. For the Commission to provide itself with an additional power to have matters referred back to it would subvert the very processes already in the Act. Such action would be *ultra vires* the Act.

12. Similarly, the Act provides the process that must be followed if a party wishes to enforce a determination[5].

13. Telecom does not agree that applying under section 58, 59 or 61 to clarify or enforce a determination is cumbersome. TelstraClear's views do not permit a move away from clear processes set out in the Act.

14. Second, the effect of TelstraClear's proposal that low level disputes be delegated to a third party would be to give a third party the right to clarify a determination, and resolve issues or disputes arising from a determination. This presumably is suggested by TelstraClear to be either a delegation of a power created by the Commission (which is *ultra vires*) or that the Commission somehow delegates its powers under sections 58 or 59 of the Act. The Commission does not have the power to determine such a process.

15. TelstraClear may argue that section 9(6) of the Telecommunications Act 2001 allows the Commission to regulate its own procedure, and that this gives the Commission the power to determine that a third party consider OSS issues. Section 9(6) only permits the Commission to regulate its own *procedure* and does not allow the Commission to create new or subvert existing powers. Section 9(6) enables the Commission to regulate its procedure as it carries out it existing powers elsewhere in the Act – eg: the procedure that sits with the determination of a section 20 application.

16. Under sections 58 and 59, there is a clear power for the Commission to clarify and reconsider a determination. TelstraClear's suggestion would, in essence, subvert this procedure provided by the Act and is clearly ultra vires the Act. Likewise, the process for enforcement is clearly set out in section 61 of the Act, and cannot be subverted by the Commission.

17. Accordingly, Telecom submits that the Commission cannot determine that a third party resolve OSS issues.

18. TelstraClear has previously argued that section 9(6) means the Commission can take on a facilitation or mediation role itself. For the reasons set out

[4] Telecommunications Act, sections 58 and 59
[5] Telecommunications Act, section 61

above we do not consider that the Commission has been afforded this role by Parliament. The role of the Commission in this case is to determine the application before it in accordance with the powers in the Act.

19. At the July workshop[6] Commission staff asked whether they should just be determining the requirements of the B2B solution rather than the process leading up to that. Reference was made to the mandating of the DSPL but the implementation being left to the parties. Telecom agrees with this approach.

20. The only issue for the Commission is the requirements it decides to determine on OSS matters. Telecom agrees with the approach in the draft determination. TelstraClear's acceptance of much of Telecom's Roadmap at the July workshop should provide the Commission with evidence that the approach in the draft determination is the correct approach. As we have previously stated, if the Commission seeks to substantially change its position in the draft determination it will first need to obtain sufficient and detailed information that it is not currently in possession of and then reconsult.

21. Finally, TelstraClear stated at the July technical workshop that it did not have a firm view on how an independent facilitator would work.[7] On this basis, Telecom is currently unable to respond to any views TelstraClear may have and seeks the opportunity to respond if there is elaboration on these views as a result of this information request.

Paragraph 7 – information passed in respect of regulatory proceeding

22. No documentation was passed between the parties in respect of the regulatory proceeding.

Yours faithfully

Anna Moodie
Regulatory and Competition Counsel

c.c: Grant Forsyth, TelstraClear

[6] Page 243 July workshop transcript
[7] Page 268 July workshop transcript

Annex A - Response to 4 (i)

Explanation of Visual Aids Titled, "ADSL Spectral Management Strategies for Crosstalk Mitigation in New Zealand"

(Presented at UBS Technical Workshop, 21 July 2005 by Lee Garth)

The commission asked for me to explain in writing the simulation parameters and methodology I used to generate the figures on pages 10 – 12 of the above-mentioned visual aids. (The simulation scenarios I considered are shown on page 9.)

In my simulations I assume a 25-pair binder containing one victim line and 24 FEXT interferers.

I. Background Noise Model

The standard thermal noise model is additive white Gaussian noise (AWGN) with a one sided PSD of -140 dBm/Hz. The actual amount of AWGN at room temperature is between -170 and -160 dBm/Hz [see *DSL Advances,* Starr et. al., page 35]. I use **-140 dBm/Hz** in my simulations.

II. The One Percent Worst FEXT Model and the FSAN Model

I use the standard model for calculating the crosstalk coupling functions in DSL, which is the **one percent worst case model**. In this model the crosstalk couplings are assumed to be at the one percent worst case, i.e. 99% of practical DSL lines have a crosstalk coupling less than this value. According to the one percent worst case crosstalk model, the *downstream* FEXT PSD of a *single* crosstalker (e.g. crosstalker # *n*) is equal to (e.g. see pg. 114 of T1E1.4/2003-210R1 or ETSI TS 101 270-1 pg. 40):

$$\mathrm{PSD}_{\mathrm{FEXT}}^{n}(f) = \mathrm{PSD}_{\mathrm{TX}}^{n}(f) \times \left|H_{\mathrm{channel}}(f)\right|^{2} \times K \times l_n \times f^{2} \qquad (1)$$

where $\mathrm{PSD}_{\mathrm{TX}}^{n}(f)$ is the transmitted PSD of the *n*-th crosstalker, $H_{\mathrm{channel}}(f)$ is the channel transfer function of the victim line, K is the coupling constant ($K = -45$ dB), l_n is the coupling path length between the victim line and the *n*-th crosstalker in meters, and frequency f is in MHz. We assume that the coupling length between any two twisted pairs is equal to the length of the shorter loop, yielding the maximum possible value. Since the crosstalkers are independent, the total FEXT power is the sum of the FEXT PSDs of all of the crosstalkers. However, since in a particular cable not all of the crosstalkers can be assigned to the bad pairs in the cable, according to the FSAN model, the total crosstalk is more accurately calculated as:

$$\mathrm{PSD}_{\mathrm{FEXT}}(f) = \left(\sum_{n=1}^{N} \left[\mathrm{PSD}_{\mathrm{FEXT}}^{n}(f) \right]^{0.6} \right)^{1/0.6} \qquad (2)$$

I use the **FSAN model** in my simulations. In the case of *N* crosstalkers with equal PSD, the above formula takes the form of equation (1) in Annex C of Telecom NZ's Cross Submission, 8 June 2005.

III. Interference due to ADSL NEXT and other services (ISDN, etc.)

In the New Zealand network, customer premises are typically not co-located. Therefore, I assume that ADSL NEXT is not a typical impairment and do not include it in my simulations. Because Telecom NZ has control over all of the services in a binder (the local loop is not unbundled) and New Zealand has a relatively low penetration of ISDN and other DSL services, again I do not include these impairments.

IV. Simulation Methodology

Unlike the statistical interference modelling method advocated by ACIF, I have used an iterative dynamic spectrum management approach to simulate the crosstalk interferers in what I consider a "typical" cable. My approach is summarised in the flowchart shown in Figure 15 of Annex C of Telecom NZ's Cross Submission, 8 June 2005. Given the channel and FEXT model, the victim and interferers are added one-by-one to the cable. When each user joins the cable it is allocated a noise margin of 12 dB and then "water-filled" into the cable, allocating signal power / bits to the best portions of the spectrum (bins) that are currently available. After each user is added to the cable, the noise margin for all of the current users is recomputed. As each user is added to the cable, the other existing users' noise margins will be pushed down slightly (recall my "turtle story" during the workshop). At some point the early users will be pushed below 0 dB. When a user is pushed below 0 dB it is re-synched, starting again with a 12 dB margin. This process of adding users, re-computing the noise margins, and re-synching if necessary is repeated until all of the users have been added to the cable. Usually it takes the dynamic spectrum management algorithm[8] three iterations, circling around the users three times, to achieve a stable solution.

The DMT / water-filling parameters I have used are summarized in Table 1.

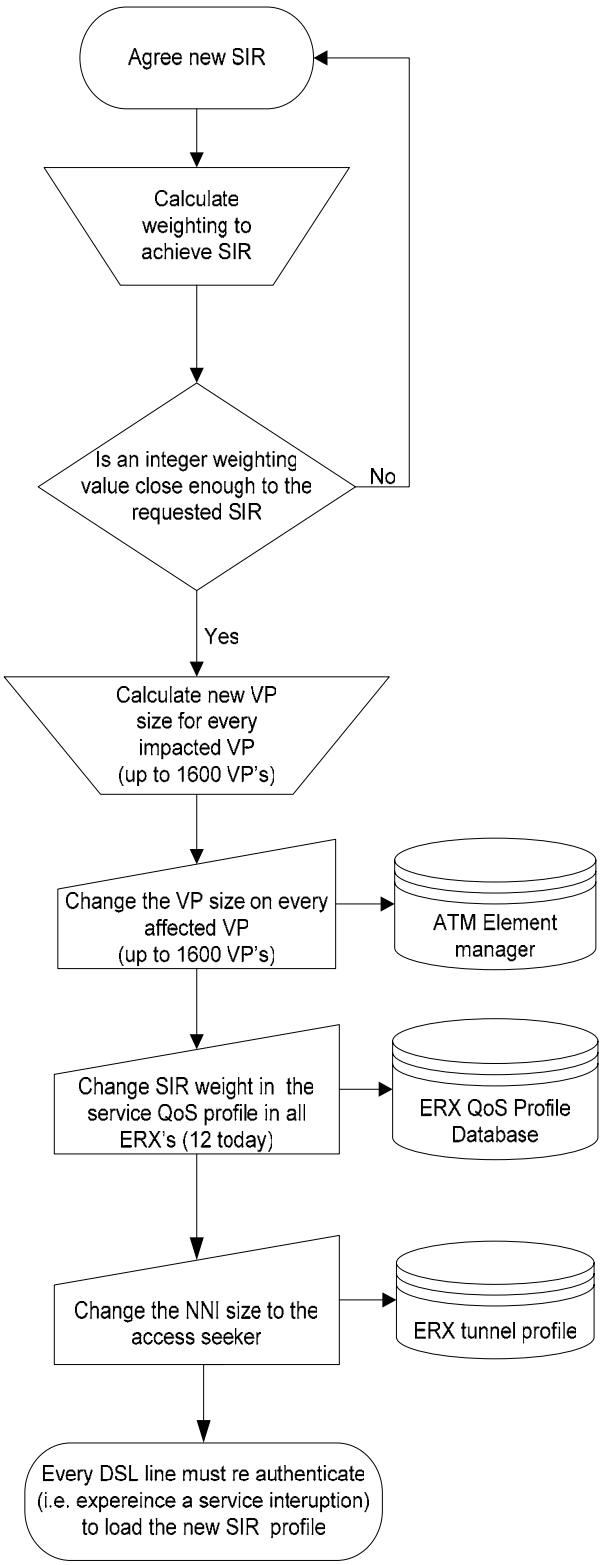
Table I. SIMULATION PARAMETERS

Noise power	-140 dBm/Hz
Total # of channels	256
Downstream channels	38 – 256 (except channel 64)
Bandwidth of each channel	4312.5 Hz
DMT symbol rate	4000 Hz
b_{max} (Maximum # of bits that can be loaded to each channel)	14

[8] Note that, unlike second-generation dynamic spectrum management techniques, my algorithm is a fully autonomous algorithm. It does not need any spectrum management unit or coordination among the users. The only requirement is that users be able to perform single-user water filling and to re-synch whenever their noise margin is pushed below 0 dB.

Annex B - Response to 4 (vii)

The following flow diagram outlines the MAC steps that would be required to change the SIR value for TelstraClear wholesale customers.



1. The process to agree the SIR value is not discussed here and is an input to the process

2. The SIR value is implemented using a weighting value in the Telecom BRAS scheduler (Juniper ERX). This must be an integer value. A specific SIR value in Kb/s is not used so the exact agreed SIR value cannot be loaded. The weighting defines an effective SIR based on the relative weightings of the service with all other services already implemented on the VP.

3. If the percentage of circuits in a VP that receive a new SIR weighting is material (more than a few percent), the total size of the VP will need to be adjusted to ensure the relative weightings retain a close match to SIR values for all services sharing the VP (both wholesale and retail services)

4. The aggregate size (total reserved VP bandwidth) of every affected VP must be manually changed to the new calculated value in the ATM network.

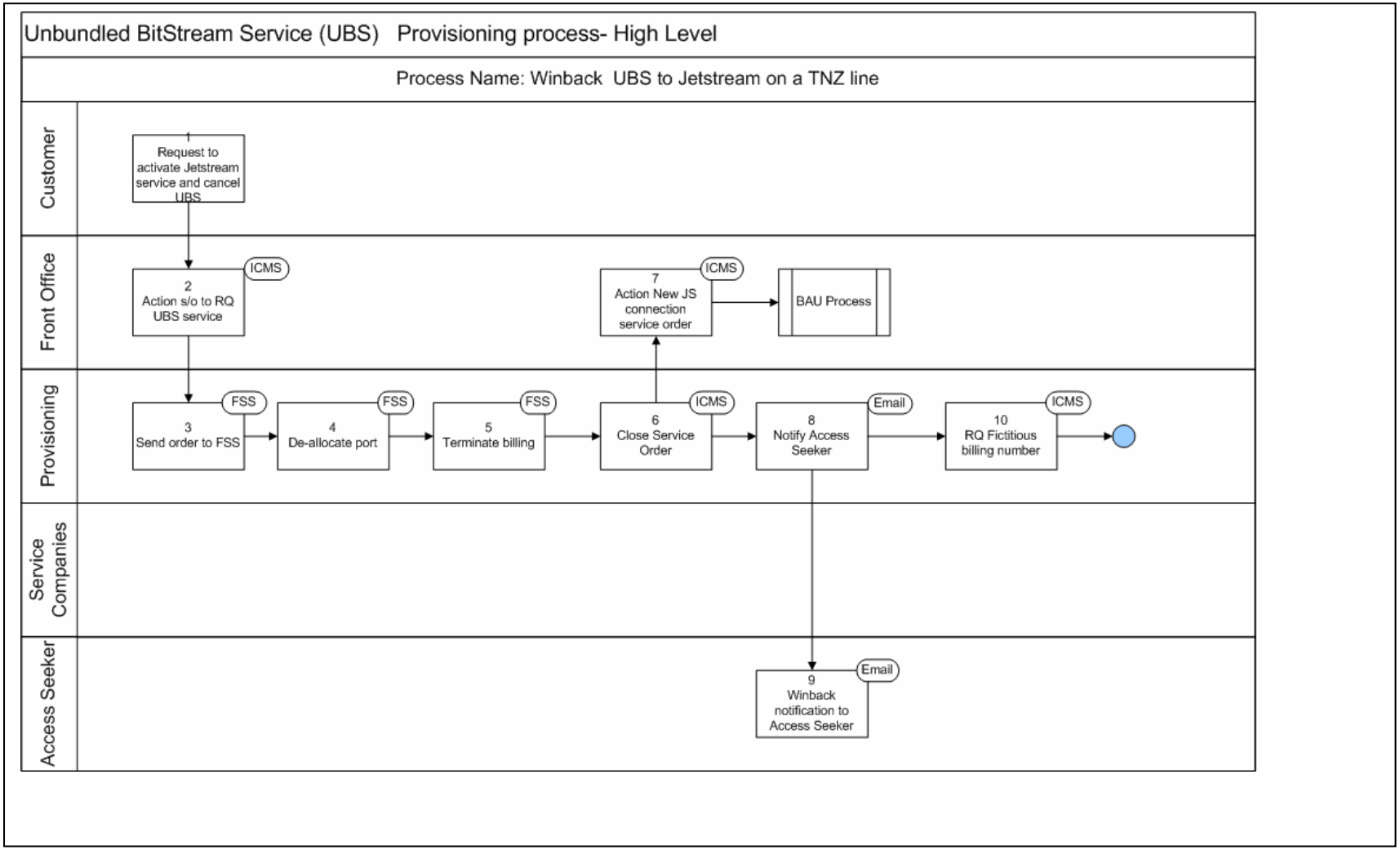
5. The new weighting value must be manually loaded into the master QoS profile for that service on each ERX. The new profile will not be loaded against an individual line until the next time that service re-authenticates

6. The size of the link between Telecom and the access seeker (the NNI) may need to be adjusted to accommodate that changed aggregate bandwidth resulting from the sum of the services using the updated SIR value.

7. As stated above, the new SIR weighting will not be loaded against in individual DSL VC until that line experiences a service disruption and re authenticates. Manually interrupting every service for force immediate re authentication is a manual task. This could be partially scripted but is still very labour intensive. The alternative is to wait until a DSL resynchronisation event occurs or the user reboots their modem.

NOTE: Telecom is aware that some DSL modems in use in the New Zealand market do not automatically re authenticate after a service interruption. These modems must be powered down and turned on again by the user to force re authentication. The access seeker must be responsible for requesting their customers re boot their modem following a fault call as a result of SIR changes before referring the fault to Telecom.

Annex C - Response to 6(i)



Step	**Description**	**Inputs**	**Tasks**	**Rules**	**Outputs**	**Systems Assessed**	**Comments**
1	Winback Customer contacts 123, 126 or indirect sales channels to request a move form UBS to Jetstream	Call from customer requesting a move of ADSL service to Telecom	Take call and customer details		Call completed and details taken	ICMS	
2	Enter a service order to RQ the UBS service		Raise an XG service order **OUT** any DJ spot codes	Memo on service order must state "ADSL WINBACK"	Service order entered	ICMS	
3	Send order to FSS		Order staged to GS		Order staged to FSS	FSS	
4	De-allocate port				Port made intact		
5	Terminate billing		Terminate account fro`m the IAF VISP		Billing terminated in IAF	IAF	
6	Close service order				Service order closed	ICMS	
7	Relinquishment of UBS service completed		Once RQ service order is completed and closed Front Office raise standard **ADSL**	New service orders must be raised as soon as RQ is completed ***"ADSL WINBACK"*** is to	Jetstream new connectionse rvice order raised. BAU process		

Step	**Description**	**Inputs**	**Tasks**	**Rules**	**Outputs**	**Systems Assessed**	**Comments**
			New Connect Orders FJ, FP, FA as required.	be included in the Service Order Memo Screen	until completion		
8	Notify UBS Access Seeker of WInback		Send notification advising Winback- BAU		Access Seeker advised	Email	
9	Access Seeker advised of Winback						
10	RQ Fictitious billing number		Action XR service order to relinquish Fictitious billing number		Fictitious number RQ'd	ICMS	