

HUTCHISON TELEPHONE COMPANY LIMITED

COMMENTS ON OFTA'S "OPEN NETWORK" REGULATORY FRAMEWORK FOR THIRD GENERATION PUBLIC MOBILE RADIO SERVICES IN HONG KONG DISCUSSION PAPER FOR INDUSTRY WORKSHOP

Hutchison Telephone Company Limited (HTCL) would like to commend OFTA's initiatives in convening the "Open Network" Industry Workshop on 5 January 2001 and urge OFTA to thoroughly consider all views expressed at the Industry Workshop and those which will be submitted to OFTA on this subject.

OFTA has outlined in the discussion paper issued for the purposes of the Industry Workshop a number of proposals for the "open network" requirement.

The key conclusions of our response to OFTA's proposals are as follows, which will be further elaborated belows:

- These proposals, which are very much in favor of the non-affiliated service providers, discourage long term infrastructure investment.
- There are many unresolved business, operational and technical issues in the discussion paper.
- Accuracy of the measurement method proposed by OFTA is highly questionable.
- The costs of such regulation will inevitably be high from the perspective of MNOs and OFTA.

HTCL would like to reiterate our position as stated in our submission on the second 3G consultation paper. While we believe NSPs are important for 3G development, opening of networks to service providers should not be mandated. Access can only be equitably achieved through commercial negotiation. NSPs do not have to bear the capital costs and risks associated with building a 3G network. Therefore requiring the MNOs to mandatorily build and maintain a reserved capacity for NSPs with uncertain demand and commitment is extremely unfair and would introduce distortions of true market behavior of 3G services.

1. Disincentives to Long Term Infrastructure Investment

- 1.1 It is evident that building a 3G network with better coverage and higher capacity will lead to greater open network obligation and higher risks for MNO. Similarly reducing surplus capacity can reduce obligation. Higher and longer term investment are therefore not encouraged.

- 1.2 With the uncertainties associated with the NSPs mandatorily imposed on the MNOs, return on investment will be hard to predict and investment plan is beyond control of network investors.
- 1.3 Consequently it will be much less costly, risky and committal to become a NSP than a MNO.

2. Definition of NSP

- 2.1 The concept of NSP also raises a number of questions. Its classification is rather loose with obligations undefined. For instance, can NSP resell the regulated wholesale capacity ? What is the meaning of "non-affiliated"? What mechanisms are there to ensure that NSP's actual usage of the capacity will not exceed the committed level?
- 2.2 Without clearly defined obligations on the part of the NSPs, HTCL is concerned that the current OFTA proposals may encourage NSPs in very short term speculation on capacity and may help creating a super NSP without investment. For instance, a single NSP may commit to take up 30% capacity from each MNO, and thus end up with an aggregate capacity of 120%, which is higher than the 70% capacity a MNO has.
- 2.3 We believe that as a basic element NSP should be subject to same regulatory requirements as MNO, such as MNP, porting charge, CLI, and other charges.

3. Determination of Wholesale Pricing

- 3.1 We are of the strong view that the wholesale price for usage to be paid by the MVNOS to the MNOs should not be determined based on the "retail minus" nor the "LRAIC" approach as suggested in the discussion paper. Both approaches are unfair as they are not commensurate with the high 3G investment and risks.
- 3.2 As stated in our submission on the second consultation paper, wholesale pricing should be determined on a case by case basis and should not be less than fully allocated cost including spectrum auction fee and capital expenditure plus 25% return of investment, as opposed to LRAIC and retail minus.
- 3.3 The great difference in the commercial risks borne by MNOs and NSPs is evident. NSPs do not have to bear any network infrastructure investment costs and OFTA proposal has not defined any minimum capacity commitment from NSP. On the other hand, in addition to shouldering the costs of building a network, MNOs will encounter unpredictable capital funding and cashflow requirements due to the uncertain demand of the NSPs. Therefore, minimum of 30% open network is far too high to be acceptable.

4. Unresolved Operational Issues

- 4.1 Regarding the operational issues, we know from experience that the busy hour of a network is different between MNO and different NSPs. The OFTA proposal using the busy hour of MNO to determine the level of network openness is highly ungrounded.
- 4.2 The lead time to build additional capacity highly depends on the network development status. It may range from just adding cards to complex year-long network expansion project.
- 4.3 It is also almost impossible to define a commonly agreeable measurement area and time for MNO and all NSPs, as the NSP would likely introduce different “innovative services” and hence will have different interest in terms of time and usage locations. Among OFTA’s suggestions, it is our view that the busiest 1% of cells is the most preferred approach.
- 4.4 The traffic forecast and network usage of NSP is totally out of control of MNO, making network dimensioning impossible and quality assurance for all end users non-effective. The traffic surge in one NSP may lead to serious degradation in quality to other NSP and MNO sharing the same network, thus rendering it impossible for MNOs to commit to the quality of service on a non discriminatory manner.

5. Unresolved Technical Issues

- 5.1 There are many unresolved technical issues in the discussion paper.
- 5.2 According to 3GPP standard, the interfaces and procedures to convey Cell-ID, i.e. cell location information, back to the core network has not been specified. Therefore it is questionable whether the Cell-ID will be available from the Call Detail Record.
- 5.3 High network processor loading in generating the huge amount of CDR and providing RAT statistic will endanger system stability, especially in busy hours.
- 5.4 Since RAT statistic is not specified in 3GPP standard, it is uncertain that it will be a part of the network statistics. The MNO may need to measure it manually by spectrum analyzer at each cell. To provide the ATCBH value would require hundreds of staff to carry out this measurement 24 hours at each cell, which is obviously impossible.

5.5 In the calculation of Actual NSP Traffic Occupancy, OFTA has proposed a formula, which is in essence

$$\text{Actual NSP Traffic Occupancy} = \frac{\text{NSP measured usage}}{\text{Theoretical radio capacity limit}}$$

5.6 Using "NSP measured usage" will under-estimate NSP occupancy of a MNO as it will not have taken into account the committed and contracted NSP capacity agreed between NSP and MNO, which the MNO is contractually bound to provide notwithstanding all contracted capacity may not have been used.

5.7 Using "Theoretical radio capacity limit" will over-estimate the network available capacity of a MNO. This can be explained as follows:

- A MNO will build and maintain system capacity (^{*Note}) based on actual usage and demand forecast. It is not the "theoretical" radio capacity that is used in radio network design. The available radio capacity that OFTA proposed is a theoretical radio capacity limit and may be much more than the required system capacity. In practice, especially at early phase of network rollout, the built capacity would be far less than the "theoretical" capacity limit.
- A MNO should not be obliged to build a radio network that will be used mainly by NSP. However, if using a x% of "theoretical radio capacity" as a criteria to determine the openness of MNO, it may lead to a situation that the MNO's built capacity is far less than x% of theoretical radio capacity, thus "forcing" a MNO to build at least x% of the theoretical capacity purely in order to meet the open network requirement.
- In practice, offered radio capacity will also depend on the node B hardware limitation (e.g. hardware channels that can be installed) and radio network design (e.g. some sites may be installed for coverage reasons). Owing to these practical concerns, a node B may never be installed to its theoretical radio capacity.

5.8 Thus, HTCL proposes that the following formula should be used:

$$\text{Actual NSP Traffic Occupancy} = \frac{\text{Higher of : (NSP committed usage or NSP measured usage)}}{\text{Installed system capacity}}$$

By using this formula, NSP committed capacity reserved by MNO can be correctly reflected. Moreover, in case NSP has actual usage higher than committed usage, the actual usage could be taken into account as well.

*Note : System capacity should refer to the minimum of the offered radio capacity, radio access system equipment capacity and core network equipment capacity.

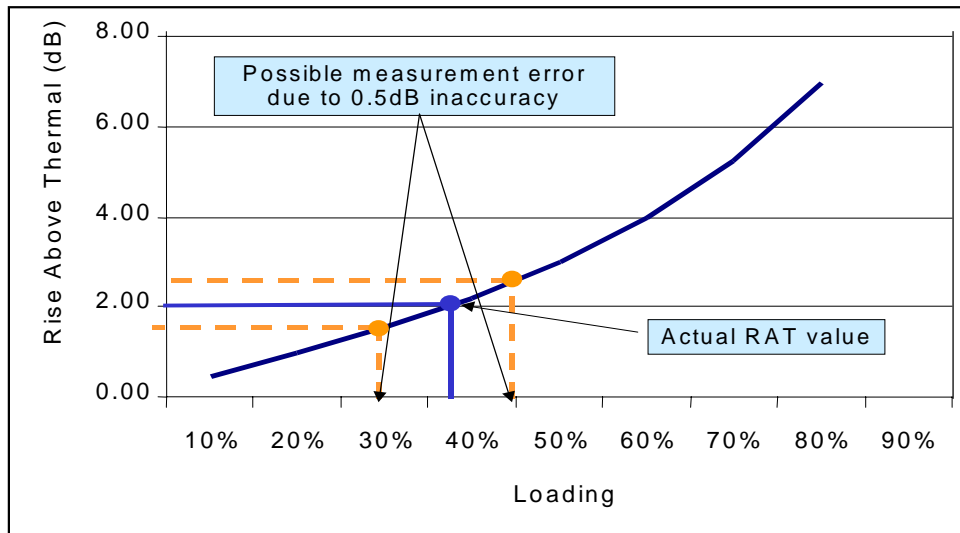
In addition, using installed system capacity as denominator is a fair reference as MNO will not be obliged to build x% of theoretical radio capacity, when even MNO itself has not reached that traffic level.

6. Poor Accuracy

- 6.1 The whole method as proposed by OFTA depends on the fact that load factor is linearly proportional to data volume. In reality, the same load factor can represent very different data volume under varying mix of data and voice traffic and different radio environments. The variance can be as large as 60%.
- 6.2 3G traffic is likely to be very asymmetric, where downlink volume is much higher than uplink. Using uplink loading to estimate the downlink capacity is bound to be inaccurate.
- 6.3 Moreover, CDR is not accurate for projection of capacity.
 - CDR cannot accurately show occupancies of multiple radio channels during soft handover.
 - Traffic volume after subsequent hand-overs is erroneously presented in the cell where the call was initiated.
- 6.4 As proposed by OFTA, Rise Above Thermal (RAT) is the reference of uplink spectrum utilization (i.e. uplink load). By using the RAT measured at a particular cell, a MNO can then determine the uplink load by using the "load curve".

An accurate measurement on RAT at each node B is therefore required to obtain a reliable figure of uplink load. However, as shown in the graph below, any deviation in the RAT measurement, which is within the industrial acceptable confidence limit (e.g. $\pm 0.5\text{dB}$) will cause a large discrepancy (e.g. from 30% up to 45% in this example) in uplink load reading.

Generic Load Curve



This kind of huge measurement error is caused by the intrinsic characteristics of load curve, where it is normal for the CDMA to work around 2dB of RAT. A deviation like 0.5dB will cause a large measurement error. This will make the RAT measurement an unreliable source to estimate the NSP occupancy.

- 6.5 As there is no industry standard measurement method for RAT, different MNO using different vendor which in turn uses different method of RAT measurement will well result in similar uplink load percentages which however may not reflect the true capacity usage. MNO may then be mistakenly required to open up more capacity when in fact it has already fulfilled the obligation. The proposed method is therefore not a reliable and fair one.
- 6.6 Moreover, in real mobile network, the “background” noise level does not only consist of thermal noise. There is lots of external interference contributing by all electrical and electronic devices (such as security alarm, TV booster, cordless phone, motor, engine, etc.) that will emit radio interference. Generally speaking, these types of interference vary from time to time and place to place. In some cases, the interference level will be as high as 6-7dB. These types of external interference will affect the background noise level and hence it will affect the accuracy of RAT measurement.

7. High Implementation Costs

7.1 OFTA’s proposal requires MNO to report huge amount of data every month. To process and generate the required data, we foresee the setup of a dedicated CDR Processing Centre to be necessary:

- The types of data to be processed include: each single CDR, location information, grouping of NSP data, RAT statistics, ATCBH calculation and conversion of voice traffic into data volume.
- The total data volume to be processed is estimated to be at least 100 times more than current voice business.

- 7.2 Huge CDR data volume and RAT statistic generation will induce much higher processor loading in every part of the network, including the radio and the core network, jeopardizing the network quality and causing wastage in capacity.
- 7.3 Since tremendous data is involved, OFTA will correspondingly incur very high costs in the regulation enforcement. If such costs are passed back to the MNOs, it will further increase the burden of the MNOs or these costs may eventually be borne by the consumers.

8. HTCL Proposals

- 8.1 Despite several rounds of discussions and consultation, there are still a lot of issues remain unresolved. We are concerned that it would be a hasty decision if these proposals to mandate open network are adopted. We therefore believe that further rounds of consultation would be required if open network is still to be mandatory.
- 8.2 It is our strong view that the connection between MNOs and NSPs should be achieved through commercial negotiation and should not be mandatory.
- 8.3 The followings are our recommendations for alternatives:
- (1) Licensing should immediately be proceeded with, without mandatory open network obligation.
 - (2) Should OFTA view that competition at the content and service level is not satisfactory or unhealthy, OFTA may consider introducing open network obligation 3 years after commercial service.
 - (3) This will provide a stable investment period for the MNOs, and sufficient time for complete network build out in Hong Kong, for the 3G technology to become mature, and for the industry to come up with better process for regulation.
- 8.4 If mandatory open network requirement were to be introduced after 3 years, we strongly propose that it should be subject to the following mandatory conditions:
- (1) wholesale pricing should not be less than fully allocated cost including spectrum auction fee and capital expenditure plus 25% return of investment, as opposed to LRAIC and retail minus
 - (2) open network obligation should be limited to a maximum of 15%
 - (3) NSP commits 5 years' capacity backed by bonds and produces monthly traffic forecast

- (4) capacity reporting only required in the case of failure to reach commercial agreement and upon dispute by NSP
- (5) NSP needs to fulfill same MNO regulatory requirements, e.g. MNP, porting charge, CLI and other charges
- (6) NSP cannot sub-lease capacity to other NSP
- (7) MNO is not obliged to lease capacity to other MNOs.