

Draft For Consultation – 11 May 2004

Draft Gazette Notification – IRS and Mandated Wholesale Services Requirements

TELECOMMUNICATIONS ACT

(CHAPTER 323)

**CODE OF PRACTICE FOR COMPETITION IN THE PROVISION OF
TELECOMMUNICATION SERVICES**

**REQUIREMENTS OF REFERENCE INTERCONNECTION OFFER –
SPECIFICATION OF INTERCONNECTION RELATED SERVICES
AND MANDATED WHOLESALE SERVICES**

It is hereby notified for general information that, pursuant to Sub-section 6.3.2 of the Code of Practice for Competition in the Provision of Telecommunication Services (G.N. No. S[•]) (the “Code”), the Info-communications Development Authority of Singapore hereby specifies the following Interconnection Related Services and Mandated Wholesale Services, and their applicable requirements, that a Dominant Licensee must offer under its Reference Interconnection Offer (“RIO”).

Citation and commencement

1. This Notification may be cited as the Code of Practice for Competition in the Provision of Telecommunication Services (RIO Requirements) Notification 2004 and shall come into operation on [insert date].

List of Services and Requirements

2. The list of Interconnection Related Services and Mandated Wholesale Services, and the applicable requirements governing the Dominant Licensee’s offer of these services, are specified in the Schedule.

**SCHEDULE OF INTERCONNECTION RELATED SERVICES
AND MANDATED WHOLESALE SERVICES
THAT MUST BE OFFERED BY A DOMINANT LICENSEE UNDER THE RIO**

1. INTRODUCTION

1.1 This Schedule describes the terms and conditions on which a Dominant Facilities-based Licensee must offer to provide certain key Interconnection Related Services* and Mandated Wholesale Services to Facilities-based Licensees and Services-based Licensees that use switching or routing equipment to provide telecommunication services to the public. The Dominant Facilities-based Licensee must include these terms in its RIO.

1.2 In this Schedule:

- (a) “Dominant Licensee” means Facilities-based Licensees that IDA has classified as dominant;
- (b) “Licensee” means Facilities-based Licensees and Services-based Licensees that use switching or routing equipment to provide telecommunication services to the public;
- (c) “Services-based Licensee” means Services-based Licensees that use switching or routing equipment to provide telecommunication services to the public; and
- (d) “Requesting Licensee” means Licensees that have requested Interconnection Related Services and/or Mandated Wholesale Services from a Dominant Licensee.

All other capitalised terms shall carry the same meaning as used in the Code.

1.3 A Dominant Licensee must offer to provide all categories of Interconnection Related Services to Facilities-based Licensees, but need only offer to provide Services-based Licensees with access to Origination, Transit and Termination services, and specified Unbundled Network Services. The Dominant Licensee must offer the same prices, terms and conditions for such services to Facilities-based and Services-based Licensees. In addition, the Dominant Licensee must offer to allow Facilities-based Licensees to obtain Mandated Wholesale Services.

* This Schedule is based on the operation of traditional telephone networks. IDA may, in future, specify additional or different requirements applicable to Dominant Licensees that control cable systems or other infrastructure that can be used to provide telecommunication services.

1.4 The terms and conditions specified in this Schedule will remain effective until revised by IDA.

1.5 As part of its review, IDA will determine whether to:

- (a) continue to require Dominant Licensees to comply with the requirements specified in this Schedule;
- (b) modify the requirements specified in this Schedule;
- (c) require Dominant Licensees to offer to provide Interconnection Related Services and Mandated Wholesale Services, but allow the Dominant Licensees to set the prices within specified price floors and/or ceilings;
- (d) require Dominant Licensees to continue to offer to provide Interconnection Related Services and Mandated Wholesale Services, without specifying price floors or ceilings;
- (e) modify or eliminate the requirement that Dominant Licensees provide Interconnection Related Services and Mandated Wholesale Services; or
- (f) take any other appropriate action.

1.6 IDA reserves the right to review and modify or eliminate the applicable requirements specified in this Schedule at any time.

2. SERVICES THAT MUST BE OFFERED UNDER THE RIO

2.1 The RIO must specify the prices, terms and conditions on which the Dominant Licensee will provide:

- (a) the following Interconnection Related Services:
 - (i) Physical Interconnection (“PI”);
 - (ii) Origination, Transit and Termination (“O/T/T”);
 - (iii) Essential Support Facilities (“ESF”);
 - (iv) Unbundled Network Elements (“UNE”);
 - (v) Unbundled Network Services (“UNS”); and
- (b) Mandated Wholesale Services.

2.2 PHYSICAL INTERCONNECTION

The RIO must specify the prices, terms and conditions on which the Dominant Licensee will physically and logically link its network with the Requesting Licensee's network. This must include:

- (a) a list and description of the physical locations at which a Requesting Licensee may interconnect and the means by which interconnection may be achieved; and
- (b) a description of the physical and logical interfaces to the Dominant Licensee's network that are necessary to allow physical interconnection and access to UNE, UNS and ESF and the procedures to be used if the Dominant Licensee chooses to alter those interfaces.

2.3 ORIGINATION, TRANSIT AND TERMINATION

The RIO must specify the prices, terms and conditions on which the Dominant Licensee will provide any Requesting Licensee with O/T/T services. In particular, the RIO must contain:

- (a) a list and description of all the O/T/T services to be provided; and
- (b) the prices, terms and conditions on which the Dominant Licensee and the Requesting Licensee will be compensated for such services.

2.4 ESSENTIAL SUPPORT FACILITIES

The RIO must specify the prices, terms and conditions on which the Dominant Licensee will provide Facilities-based Requesting Licensees with access to ESF. In particular, the RIO must contain:

- (a) the prices, terms and conditions on which a Facilities-based Requesting Licensee can physically co-locate equipment within the Dominant Licensee's network, including:
 - (i) the locations at which physical co-location are available;
 - (ii) any reasonable restrictions or procedures that the Dominant Licensee intends to impose due to space, safety or security concerns; and
 - (iii) the situations in which virtual (distant) co-location will be required.

- (b) the prices, terms and conditions on which the Dominant Licensee will provide Facilities-based Requesting Licensees with access to:
 - (i) lead-in ducts and lead-in manholes;
 - (ii) space within cable risers in commercial and residential buildings; and
 - (iii) radio towers and tower sites.

2.5 UNBUNDLED NETWORK ELEMENTS AND UNBUNDLED NETWORK SERVICES

The RIO must contain the prices, terms and conditions on which the Dominant Licensee will offer to provide UNE to Facilities-based Requesting Licensees, and will offer to provide UNS to Facilities-based and Services-based Licensees, including:

- (a) a list and description of the UNE and UNS to be provided;
- (b) any modification that the Dominant Licensee is prepared to make;
- (c) the extent to which the Dominant Licensee is prepared to combine individual elements; and
- (d) the prices that the Dominant Licensee will charge for UNE and UNS.

2.6 MANDATED WHOLESALE SERVICES

The RIO must specify the prices, terms and conditions on which the Dominant Licensee will offer to provide Mandated Wholesale Services (where specified by IDA) to Requesting Licensees.

3. DESCRIPTION OF SERVICES

- 3.1 This Sub-section sets out the requirements and technical characteristics of the Interconnection Related Services and Mandated Wholesale Services that must be offered by the Dominant Licensee under its RIO.

3.2 PHYSICAL INTERCONNECTION

- 3.2.1 Physical Interconnection (“PI”) requires the provision and maintenance of transmission links between each Facilities-based Licensee’s network for the purpose of exchanging traffic.

- 3.2.2 A Dominant Licensee must offer to allow the physical linking of facilities-based networks at any technically feasible point. At a minimum, a Dominant Licensee must offer to allow traffic exchange to occur at the following Points of Interconnection (“POI”):
- Interconnect gateway switches; and
 - Local switches (line side and trunk side).
- 3.2.3 The interconnecting transmission links must connect at mutually agreed points and support applicable technical standards and transmission protocols.
- 3.2.4 A Dominant Licensee need only offer Services-based Licensees virtual (distant) interconnection. In a virtual interconnection arrangement, the network nodes are not located at the same site. In this arrangement, the Services-based Licensee may obtain the interconnection link between the 2 nodes from either the Dominant Licensee or any other Facilities-based Licensees, with the costs of this link borne by the Services-based Licensee.
- 3.2.5 A Dominant Licensee must provide, and may require a Requesting Licensee to provide, reasonable capacity to meet forecast traffic flow.
- 3.2.6 Physical interconnection may also take place to provide access to UNE, UNS and ESF. A Dominant Licensee must offer to provide Facilities-based Licensees access to UNE and UNS at the following Points of Access (“POA”):
- Distribution frames (exchange MDF, building MDF and roadside cabinet);
 - Fibre distribution frames; and
 - Digital cross connect frames.
- 3.2.7 A Dominant Licensee must also offer to provide Facilities-based Licensees with access to ESF and UNE at the following POA (when controlled by the Dominant Licensee):
- Lead-in ducts and lead-in manholes;
 - Exchange buildings housing tandem, local, interconnection and international switches and facilities;

- Building equipment rooms; and
- Roof spaces.

3.2.8 A Dominant Licensee must provide all relevant signalling plans, including the technical specifications, interconnection test plans and the corresponding test schedules, to any Requesting Licensee.

3.3 ORIGINATION, TRANSIT AND TERMINATION

3.3.1 O/T/T services involve the switching, routing and transmission of telecommunication traffic between Licensees. O/T/T services allow traffic originating from one Licensee's network to terminate or transit through another Licensee's network.

3.3.2 A Dominant Licensee must offer to provide O/T/T services to any Requesting Licensee. The Dominant Licensee need only offer to provide transit services between Licensees interconnected to the Dominant Licensee's interconnection gateway switch ("IGS"). The Dominant Licensee need not offer to route transit traffic between the IGS and a local switch. In the case of transit traffic, the Dominant Licensee may require the Licensee originating the call to pay the Dominant Licensee for the cost of transit, irrespective of the type of traffic and payment between the End User and the 2 Non-dominant Licensees that are using the transit service.

3.3.3 A Dominant Licensee must provide the following O/T/T services:

- Line side (local exchange) origination (3-digit and 4-digit access codes): Priced on a per call-minute basis;
- Line side (local exchange) termination (8-digit numbers): Priced on a per call-minute basis;
- Trunk side (local exchange) origination (3-digit and 4-digit access codes): Priced on a per call-minute basis;
- Trunk side (local exchange) termination (8-digit numbers): Priced on a per call-minute basis;
- IGS origination (3-digit and 4-digit access codes): Priced on a per call-minute basis;
- IGS termination (8-digit numbers): Priced on a per call-minute basis; and
- IGS transit: Priced on a per call-minute basis.

3.4 ESSENTIAL SUPPORT FACILITIES

3.4.1 ESF are passive support structures, for which no practical or viable alternatives exist, that enable the deployment of telecommunication infrastructure.

3.4.2 A Dominant Licensee must offer to provide Facilities-based Licensees the following ESF:

- Co-location;
- Lead-in ducts and lead-in manholes;
- Space within cable risers in commercial and residential buildings; and
- Radio towers and tower sites.

3.4.2.1 Co-Location

3.4.2.1.1 A Dominant Licensee must offer to allow Facilities-based Licensees to co-locate equipment for the purpose of PI, and accessing UNE and UNS, at any technically feasible location within the network. The RIO must specify the prices, terms and conditions on which the Dominant Licensee will allow co-location at the following facilities (when controlled by the Dominant Licensee):

- Exchange buildings housing tandem, local, interconnection and international switches and facilities;
- Telecommunication equipment rooms located in commercial buildings;
- Telecommunication equipment rooms located in residential buildings;
- Submarine cable landing stations;
- Radio towers and tower sites; and
- Roof spaces.

3.4.2.1.2 The Dominant Licensee must offer to provide equipment space, power, security and site maintenance at each co-location site.

3.4.2.1.3 A Dominant Licensee may decline to provide co-location space in any

currently unused network location if it can demonstrate that, as a result of its reasonably projected growth, the Dominant Licensee will use that space to locate equipment used to provide its own telecommunication service.

- 3.4.2.1.4 In cases where a Dominant Licensee cannot offer physical co-location due to space limitations or any other legitimate reasons, the Dominant Licensee must take reasonable measures to find an alternative solution. An alternative solution may include options such as virtual co-location, conditioning additional equipment space, optimising the use of existing space or finding adjacent space. The Dominant Licensee is not required to offer to construct additional buildings to accommodate co-location requests.
- 3.4.2.1.5 A Dominant Licensee must not restrict the type of equipment co-located so long as it is telecommunication equipment of a type customarily located in a telecommunication operator's exchange building or other network locations. However, this space cannot be used for the co-location of a specific End User's equipment (e.g., a PABX) or general purpose computing equipment that is not required for operation or management of the co-located equipment (e.g., a billing system). The equipment footprint space made available by the Dominant Licensee to each Facilities-based Licensee at each exchange building must be no less than 1 square metre and no more than 10 square metres, provided that where a Requesting Licensee reasonably requests for footprint space exceeding 10 square metres, the Dominant Licensee must grant the request unless the Dominant Licensee can demonstrate that the use of more than 10 square metres of footprint space will preclude other Facilities-based Licensees from placing permitted equipment in a given exchange building.
- 3.4.2.1.6 A Dominant Licensee must take all reasonable measures to reduce the costs to be assumed by the Facilities-based Requesting Licensee. In particular, the Dominant Licensee may not require the use of co-location cages or equivalent structures or impose any unnecessary or excessive minimum space requirements. The Dominant Licensee must incur the cost of preparing co-location space, which it can recover through non-discriminatory, pro-rata prices to be paid by Facilities-based Requesting Licensees.
- 3.4.2.1.7 A Dominant Licensee must offer Facilities-based Requesting Licensees access to their co-located equipment on a 7 days a week, 24 hours a day basis. The Dominant Licensee can require reasonable security precautions. These can include escorted access, provided the escort is available 7 days a week, 24 hours a day. The Dominant Licensee must make escort available on the following basis:

- for service-affecting emergencies, within 1 hour of notification;

- for non-service affecting emergencies, within 4 hours of notification; and
- in all other cases, within 24 hours of notification.

3.4.2.2 Lead-in ducts and lead-in manholes

3.4.2.2.1 Lead-in ducts and lead-in manholes are ESF that house the copper, coaxial and fibre cables that connect to buildings.

3.4.2.2.2 A Dominant Licensee must offer to lease the lead-in ducts and lead-in manholes to Facilities-based Requesting Licensees for the purpose of placing their own telecommunication transmission cables. The Dominant Licensee must maintain the lead-in ducts and lead-in manholes, and also be responsible for any right of way fees payable, where applicable.

3.4.2.3 Space within cable risers in commercial and residential buildings

3.4.2.3.1 A Dominant Licensee must offer to provide Facilities-based Licensees access to space within cable risers used to provide services to the building tenants. This must include access to any distribution frames, cabinets or network interface devices within the buildings where they are the properties of the Dominant Licensee. (The guidelines for building owners are set out in the Code of Practice for Info-communications Facilities in Buildings.)

3.4.2.4 Radio towers and tower sites

3.4.2.4.1 A Dominant Licensee must offer to provide Facilities-based Licensees access to radio towers and tower sites, used for the location of radio transmission or reception equipment and including space for baseband equipment.

3.5 UNBUNDLED NETWORK ELEMENTS

3.5.1 UNE are physical telecommunication plant and equipment and the associated service functionality that Facilities-based Requesting Licensees need to have access to in order to provide a competing telecommunication service. IDA will find that Facilities-based Requesting Licensees needs to have access to a UNE if the element:

- (a) is technically or operationally required to provide a competing service; and

- (b) cannot be replicated, or obtained from a source other than the Dominant Licensee, at commercially reasonable rates.

3.5.2 A Dominant Licensee may not place any restriction on the buyer of a UNE as to the End Users or Licensees to which any telecommunication service provided using the UNE may be offered. For example, a Licensee can lease copper local loop for the provision of Digital Subscriber Line (“DSL”) services, for resale to other Facilities-based or Services-based Licensees.

3.5.3 A Dominant Licensee must offer to lease to Facilities-based Licensees the following UNE:

- Local loops;
- Sub-loops; and
- Distribution Frame Access.

3.5.3.1 Local loops — including loop feeder, loop distribution, distribution point, and inside wiring (where applicable)

3.5.3.1.1 The Dominant Licensee must provision the loops in a timely and non-discriminatory manner, and must take all feasible actions to provision loops that are suitable for digital signal transmission. The Dominant Licensee will retain responsibility for the maintenance and administration of the loops.

3.5.3.1.2 The Dominant Licensee must provide loops that are of the same quality and capable of supporting the same transmission characteristics as those it supplies to its own End Users. The Dominant Licensee must also provide maintenance and repair services on the unbundled loops that is equivalent to the service it would provide on loops serving its own End Users.

3.5.3.1.3 To maintain the integrity of the loop and associated equipment, a Dominant Licensee may retain responsibility for performing the necessary cross-connections and circuit-grooming activities required at the distribution frames to connect the Facilities-based Requesting Licensee’s equipment to each loop provided. However, the Dominant Licensee must not use this authority in a manner that restricts supply. If the Dominant Licensee performs these functions, it must recover the cost through the loop prices.

3.5.3.1.4 Where the Facilities-based Requesting Licensee plans to use the loop to provide a DSL type service, the loop performance should be typical of those used by the Dominant Licensee for its own DSL services. This

requires the Dominant Licensee to “condition” a loop pair. Typically, this will require the Dominant Licensee to remove any impediments to DSL service (such as bridge taps and loading coils) and to choose a pair that is unlikely to suffer from interference caused by other DSL services. A Dominant Licensee does not have any obligation to guarantee loop performance beyond voice-grade standard. However, in so far as it uses loops for its own DSL services, a Dominant Licensee must supply loops to other Requesting Licensees for DSL that perform at a level equivalent to the loops the Dominant Licensee uses for its own DSL services. If the Dominant Licensee chooses to guarantee its End Users loop performance above a voice-grade standard, loops provided to other Licensees must also meet this guarantee.

3.5.3.2 Sub-loops — including loop feeder, and loop distribution, distribution point and inside wiring (where applicable)

3.5.3.2.1 A Dominant Licensee must also offer to provide sub-loops and the associated distribution points available to Facilities-based Requesting Licensees on the same terms and conditions as loops.

3.5.3.3 Distribution Frame Access — exchange MDF, building MDF and roadside cabinets

3.5.3.3.1 A Dominant Licensee must offer to provide Facilities-based Requesting Licensees with access to its distribution frames in order to allow the Facilities-based Requesting Licensees to place the terminal blocks and cabling required to cross-connect the loop to the Facilities-based Requesting Licensee’s equipment.

3.5.3.3.2 A Dominant Licensee must offer to provide Facilities-based Requesting Licensees with pins on the Dominant Licensee’s distribution frames for the purposes of connecting their cables. The Dominant Licensee must develop a reasonable process for allocating pins to Facilities-based Requesting Licensees and for updating plant records. Where physical space is available, the Dominant Licensee must offer to construct additional distribution frame capacity to meet requests for access. The Dominant Licensee must detail the process for allocating pins in its RIO.

3.6 UNBUNDLED NETWORK SERVICES

3.6.1 UNS are telecommunication network services that Requesting Licensees need to have cost-based access to in order to provide a competing telecommunication service. IDA will find that a Requesting Licensee needs to have access to a UNS if the service:

- (a) is technically or operationally required to provide a competing service; and
- (b) cannot be self-provisioned, or obtained from a source other than the Dominant Licensee, at commercially reasonable rates.

3.6.2 A Dominant Licensee must offer to provide the following UNS:

- Emergency Services; and
- Connection services at submarine cable landing stations.

3.6.2.1 Emergency Services

3.6.2.1.1 A Dominant Licensee must offer to provide Facilities-based and Services-based Requesting Licensees with access to emergency services call centres and the ability to add local telephone location data to the emergency services database.

3.6.2.2 Connection services at submarine cable landing stations

3.6.2.2.1 A Dominant Licensee must offer to provide services at its submarine cable landing stations in order for Facilities-based Requesting Licensees to connect and access capacity on any submarine cable system landing at those submarine cable landing stations.

3.7 MANDATED WHOLESALE SERVICES

None specified.