

**Mini-estudio de caso de 2003 de la India**

**Solución de problemas  
en materia de interconexión y  
de contribuciones por déficit de  
acceso en un entorno de  
multioperadores**



International Telecommunication Union

Este mini estudio de caso ha sido realizado por Robert Bruce y Rory Macmillan de Debevoise & Plimpton, Londres, R.U. Las opiniones reflejadas en este documento son las de los autores y no reflejan necesariamente las de la UIT, sus Miembros o del Gobierno de la India.

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Este estudio forma parte de una serie de cinco estudios sobre la solución de controversias en la interconexión llevadas a cabo por la UIT. Para más información, sírvase consultar el sitio: <http://www.itu.int/ITU-D/treg>

## **Miniestudio de caso de la India: Solución de problemas en materia de interconexión y de contribuciones por déficit de acceso en un entorno de multioperadores**

### **I. Introducción: Transición del sector de las telecomunicaciones en la India a un mercado plenamente abierto a la competencia**

Con una tasa demográfica que supera los mil millones de habitantes y un PNB que alcanza los 500 mil millones de dólares, la India cuenta con alrededor de 40 millones de líneas fijas, 16 millones de abonados a servicios de telefonía celular GSM y 4 millones de abonados al bucle inalámbrico CDMA móvil (WLL(M)). Lo anterior significa que el país tiene un nivel de densidad telefónica combinada de aproximadamente seis líneas por cada 100 habitantes. La Política Nacional de Telecomunicaciones de la India de 1999 exige que se alcance un nivel de densidad telefónica de línea fija de siete antes de 2005 y de 15 antes de 2010. Para lograr este objetivo, la India se esfuerza activamente por crear un entorno de competencia en el que participen múltiples operadores. Ello ha permitido abrir a la competencia de los sectores de telefonía fija, celular, de larga distancia nacional y larga distancia internacional.

Era de esperar que en el entorno de multioperadores de la India surgiera la necesidad de interconectar eficazmente los principales operadores de telecomunicaciones. La competencia encarnizada que se desató entre estos operadores por obtener una parte de un mercado sensible a los precios, ha dado lugar a un sinnúmero de controversias en materia de interconexión. Tal y como se expone a continuación, muchos de estos desacuerdos han surgido a causa de la llegada de los proveedores de servicios de movilidad limitada basados en el WLL (los servicios de WLL(M)) y de sus competidores que ofrecen servicios de telefonía celular móvil.

Este miniestudio de caso no refleja la naturaleza intrincada e interdependiente de los problemas que han surgido en materia de reglamentación y que han de resolver el Organismo de Reglamentación de las Telecomunicaciones de la India (TRAI) y el Gobierno de la India, ni tampoco describe de manera completa y detallada el contexto actual de apertura del sector de telecomunicaciones de la India. En cambio, en este Informe se describe y analiza someramente uno de los problemas más recientes del país: a saber, el de las tasas por utilización de la interconexión (IUC), y la relación que guarda este asunto con las tasas por déficit de acceso (TDA) y el reequilibrio de las tasas.

Además, no nos limitamos a examinar cuestiones de interconexión, sino también las propuestas hechas por el TRAI para poner en práctica un sistema unificado de concesión de licencias, cuyo objetivo sea fomentar el desarrollo del sector de las telecomunicaciones del país. En este Informe la idea es señalar algunas de las dificultades a las que durante cierto tiempo se enfrentaron la India y otros países cuyas telecomunicaciones han dejado de ser un sector dominado por un monopolio estatal para convertirse en un mercado abierto a la competencia y que tiende a la convergencia y la sustitución entre servicios alámbricos e inalámbricos.

### **II. Panorama general del mercado**

Antiguamente, la India tenía un operador monopolístico público (VSNL) para las llamadas de larga distancia internacional y otro operador monopolístico público (BSNL) para las llamadas de larga distancia nacional. Otro operador local público (MTNL) prestaba servicios en Mumbai y Delhi. Como en la última década el país liberalizó progresivamente su mercado, se concedieron licencias a una serie de nuevos operadores para competir en estos mercados. Estas licencias se otorgaron para cada una de las áreas previstas a nivel de "círculos de telecomunicación" (es decir, zonas definidas) o a nivel nacional.

A efectos de la concesión de licencias para servicios fijos, la India se ha dividido en 21 zonas que en la actualidad cuentan con dos o tres proveedores de servicios. Además de los servicios de líneas fijas, las nuevas licencias permiten el suministro de servicios WLL(M), cuya movilidad se encuentra restringida a un zona de tasación de corta distancia o a un área local con una cobertura de aproximadamente 25 km de radio. En cuanto al segmento de telefonía celular GSM, la mayoría de las 25 zonas designadas para la concesión de licencias cuentan con la presencia de cuatro operadores. Lo mismo ocurre con los segmentos de servicios de llamada de larga distancia nacional e internacional, que suministran cuatro proveedores de servicio.

El Gobierno ha vendido una participación mayoritaria de VSNL al operador privado Tata. Pese a que BSNL y MTNL, abrieron sus mercados, ambos poseen más del 98% del segmento de línea fija y BSNL sigue siendo el principal operador de llamadas de larga distancia nacional, aunque los nuevos operadores han aumentado su parte de tráfico correspondiente a servicios celular a celular de larga distancia. Del mismo modo, VSNL sigue siendo el operador tradicional de servicios internacionales para el tráfico internacional saliente, aunque en estos momentos se enfrenta a la dura competencia de los nuevos operadores del tráfico internacional entrante. Bharti, Reliance y Tata tienen una participación muy activa en la mayoría de los segmentos del mercado de telecomunicaciones.

Una vez finalizada la cuarta licitación para la concesión de licencias de telefonía celular, el Gobierno anunció el lanzamiento de su política sobre competencia abierta en el segmento de mercado de telefonía fija, por lo que se permitió a los operadores de telefonía fija prestar servicios de movilidad limitada dentro de áreas de llamada local (SDCA). Desde entonces, los operadores de telefonía celular GSM han señalado que los operadores de líneas fijas ingresaron de manera ilícita al mercado de telefonía móvil y no tuvieron necesidad de pagar cánones elevados para obtener las correspondientes licencias. Si bien los operadores de telefonía celular GSM han declarado la guerra a estos servicios WLL(M), oponiéndose a una serie de normas de reglamentación prolijas y librando batallas penales enconadas con el fin de que se reconozca la ilegalidad de los operadores de estos servicios WLL(M), perdieron esta batalla en agosto de 2003, como indica el hecho de que actualmente existen alrededor de 4 millones de abonados WLL(M). Se le ha pedido al TRAI que se encargue de varias cuestiones relacionadas con los cánones de entrada al mercado y las tasas por utilización del espectro y aunque su documento de consulta sobre el tema no se ha terminado de redactar, se ya encuentra a disposición del público.

### **III. Aspectos de interconexión**

En el transcurso de los dos últimos años, el TRAI ha aplicado varios procedimientos de consulta que poco a poco han contemplado muchos aspectos de reglamentación recientes para abordar necesidades del nuevo entorno multioperadores. Al final de este Informe puede verse una lista de estas cuestiones.

El 1 de mayo de 2003 se puso en práctica un nuevo sistema de IUC después de que se promulgara la orden del TRAI de 24 de enero de 2003. Asimismo, el nuevo sistema de IUC introdujo el principio de pago por la parte llamante (CPP) en el segmento de mercado de telefonía celular GSM. Además, las anomalías que presentaba el nuevo sistema favorecía las llamadas de larga distancia GSM a GSM y WLL a WLL con respecto a las llamadas de larga distancia de red fija a red fija. En este respecto, el 15 de mayo de 2003 se publicó un documento de consulta sobre las IUC.

El TRAI ya ha introducido un plan para el cálculo de las tasas de transmisión, origen y terminación basado en el costo. Las tasas IUC en concepto de llamadas de origen o terminación en la red de línea fija están integradas por las tasas de origen y de terminación y un componente adicional de las ADC que se calcula por minuto. Las tarifas ADC se utilizan para resolver los problemas que plantea una política estatal que permite a los operadores de servicios básicos (BSO) recibir tasas subsidiarias mensuales y les exige que apliquen tarifas baratas a las llamadas locales y ofrezcan cierto número de llamadas gratuitas a todos sus abonados (empresariales y residenciales).

Los BSO afirman que se les ha obligado a suministrar tales servicios a bajo costo. El servicio local asequible se ha financiado tradicionalmente con las ganancias que obtiene el operador público (conocido actualmente con el nombre de BSNL), del servicio de larga distancia y los ingresos del servicio internacional que generaba el entonces operador internacional en régimen de monopolio, VSNL. Estos operadores compensaban sus "pérdidas" distribuyendo los ingresos que resultaban de las ganancias de las llamadas nacionales y de larga distancia internacional.

No obstante, desde que comenzó la liberalización, la competencia en el mercado de servicios de larga distancia ha reducido los precios que se pagan por los servicios de larga distancia en más del 50%, ya que el sistema de IUC ha desplazado el tráfico nacional de larga distancia del sector de telefonía fija a los sectores GSM y WLL(M). Gracias a la llegada de los servicios GSM y los precios atractivos aplicados a los servicios WLL(M), se está produciendo un desplazamiento de la red de línea fija hacia el segmento GSM y WLL(M). Ello trae como resultado una disminución en el número de minutos utilizados en las llamadas de larga distancia, lo que podría tener como efecto aumentar las ADC por minuto en el caso de las llamadas que siguen pasando por las redes de línea fija, lo que se traducirá en una disminución aún mayor del número de abonados y del tiempo de utilización. Además, es prácticamente imposible que los operadores de línea fija puedan seguir subvencionando las llamadas locales con los ingresos que obtienen de las llamadas internacionales, pues la apertura del mercado a la competencia y la llegada en 2002 del protocolo de transmisión de voz por Internet (VoIP) ha hecho que disminuya el precio de las llamadas internacionales. Es por ello que, con la llegada de la competencia en la India y en los demás países, las tarifas de larga distancia nacional e internacional han disminuido vertiginosamente y ya no permiten seguir financiando los servicios locales mediante subvenciones internas o distribución de ingresos, ya que en un entorno de competencia es necesario implantar un régimen de interconexión basado en el costo.

Así pues, las tarifas ADC constituyen un mecanismo transparente para seguir aplicando subvenciones cruzadas entre servicios en un régimen de interconexión. No obstante, la aplicación del plan ADC es problemática en la India, lo que era de esperar teniendo a la vista la experiencia de otros países, como el Reino Unido.

El documento de consulta sobre las IUC publicado el 15 de mayo de 2003, se centra en las múltiples anomalías que se detectaron en la implementación del nuevo sistema IUC en cuanto a la relación entre operadores de líneas fijas y celular en un entorno de competencia, sino que también permite recabar comentarios, basándose en el cálculo de las ADC. Por ejemplo, en el documento se pregunta si las ADC deben estimarse basándose en los costos incrementales a largo plazo (LRIC), en cuyo caso se tomarían en consideración las nuevas opciones de tecnología rentables como fibra en el bucle, inalámbrica en el bucle y conmutadores con capacidad de gestionar un gran volumen de tráfico. A la vista de los problemas prácticos que puede acarrear la implementación del sistema de ADC y las consiguientes preocupaciones, es de esperar que el TRAI desee describir la forma de reducir el monto de las ADC recurriendo a un método diferente de asignación de costos.

#### **IV. Posibles soluciones al problema de las ADC**

##### **(a) Reequilibrado de las tasas**

Además de reducir el monto de las ADC recurriendo a un método diferente de asignación de costos, el TRAI también puede analizar las cuestiones relativas al reequilibrio de las tasas que se plantearon en la consulta sobre tarificación de 23 de septiembre de 2002 y en la Orden TT de 24 de enero de 2003, las cuales se consignan al final de este Informe.

No cabe duda de que en la India se suscitan asuntos de política y reequilibrado tarifario sumamente delicados. No obstante hay señalar que las preocupaciones expresadas en relación con las anomalías y efectos perturbadores en las ADC no se podrían mitigar con sólo reducir las estimaciones de los costos que contribuyen al déficit. El déficit se podría corregir rápidamente dando más flexibilidad a los operadores para recortar el déficit real, aunque para ello tengan que aumentar las tasas. Ésta es una cuestión que merece análisis exhaustivo no sólo en el contexto de la India sino también por parte de otras administraciones nacionales que afrontan los mismos problemas de política.

Podría ser útil citar algunos hechos relacionados con el proceso de reequilibrado de las tasas para ilustrar el problema. En primer lugar, la política del TRAI permite que las fuerzas del mercado determinen el precio de los servicios de telefonía celular y de los servicios de WLL. Los servicios de telefonía fija se consideran como servicios esenciales y el TRAI estipula que "también se pide la intervención del organismo de reglamentación para alcanzar el objetivo social de una telefonía básica asequible". (Punto 16 de la Consulta sobre Tarificación.) Sin embargo, en la Consulta sobre Tarificación aparece un comentario interesante que se reproduce a continuación:

*"Aunque esta conclusión fuera correcta, limitarse a analizar el mercado de servicios básicos y las contribuciones de los distintos operadores de servicios básicos (BSO) podría inducir a error ya que en este análisis no se tendría en cuenta la llegada al mercado de otros proveedores de acceso, como por ejemplo los operadores de telefonía celular. En la medida en que estos dos servicios de acceso sean intercambiables, una definición más amplia del mercado, en la que se incluyan los servicios de telefonía básica y celular, podría ayudar a comprender mejor la índole y el grado de la competencia, aspectos que no son iguales cuando se consideran los mercados de telefonía básica y celular como mercados independientes." (Id.)*

En resumen, convendría examinar con mayor detenimiento el tratamiento desigual que se da en la actual reglamentación a los servicios de telefonía celular y de WLL por un lado, y a los servicios de línea fija, por otro lado, en el contexto de la Consulta Unificada para la Concesión de Licencias lanzada recientemente por el TRAI y que se analiza en la siguiente sección de este miniestudio de caso.

El TRAI anotó en su Consulta sobre Tarificación de 23 de septiembre de 2002, que "aunque el reequilibrado permitió que se recalcularan las tasas de los usuarios comerciales, ninguno de los proveedores de servicio ha aumentado el precio de estas tasas". Asimismo, el documento de consulta señala que "por consiguiente, los proveedores de servicio, no han reequilibrado este elemento aunque tuvieron la oportunidad de hacerlo y que a causa de ello dejaron de percibir ingresos indispensables que podrían haber utilizado para cubrir, al menos, una parte del déficit de acceso que, por otra parte, es elevado". Es posible que una de las causas sea que los abonados de servicios móviles y de WLL siguen siendo abonados de líneas fijas y que los operadores no aumentan las tasas de los usuarios comerciales por temor a que los abonados cancelen sus conexiones de línea fija, especialmente los clientes comerciales con tasas elevadas de llamada. Es por ello que, debido a presiones comerciales de esta naturaleza, el enfoque general del TRAI para reequilibrar su Orden TT de 24 de enero de 2003 se podría calificar de prudente con respecto al reequilibrado, sobre todo, de las tasas aplicadas a los clientes comerciales.

(b) Control de tarifas selectivo

En la Orden TT -y la consulta en materia de costos conexas- también se contemplaron otros elementos importantes de las tarifas locales: duración de un impulso, tasas por impulso, números gratuitos, etc. Entre las opciones para reducir las ADC figura la de concentrar en mayor medida el control de las tarifas locales en los servicios que ofrecen conectividad básica, por ejemplo, una línea de acceso y un número mínimo de llamadas. Aparte de esto, a la vista de la presencia de otros BSO en el mercado de telefonía fija y de los posibles efectos de sustitución de los operadores de telefonía celular, se justificaría el hecho de dar mayores posibilidades a los BSO para que fijen las tarifas locales, basándose en razones similares a las que se dieron en el caso de los operadores de telefonía celular y de WLL. Convendría considerar si también podría otorgarse total flexibilidad en la fijación de tarifas a los proveedores de servicios de líneas fijas, salvo quizá en zonas rurales que actualmente son atendidas principalmente por BSNL.

(c) Reconocimiento de los efectos de la convergencia y posibilidad de sustitución entre los servicios alámbricos e inalámbricos

El TRAI tiene previsto tomar una decisión con respecto a los problemas planteados por las tarifas IUC y ADC. No obstante, es posible que haya razones que aconsejen analizar con más detenimiento las cuestiones subyacentes a la competencia entre los operadores de líneas fijas y móviles. Cabe señalar que el problema de convergencia y transición en el sector de telecomunicaciones de la India se examina también en la Consulta Unificada para la concesión de licencias publicada recientemente y que se analiza a continuación.

## V. Consulta Unificada para la Concesión de Licencias de 20 de julio de 2003

El documento de Consulta Unificada para la Concesión de Licencias del TRAI se centra en el hecho de que en la India las licencias de los servicios básicos y móviles se concedieron por separado. Las condiciones de las licencias se han unificado considerablemente, por ejemplo, con respecto a los cánones de concesión de licencia anuales, las tasas por utilización del espectro, la autorización de movilidad (aunque con restricciones) y el acceso al Fondo de Obligación de Servicio Universal. Sin embargo, aún persisten ciertas diferencias en esferas tales como la diferencia de precios de los cánones de instalación que pagaron los primeros operadores en comparación con los nuevos operadores, las zonas de servicio, el nivel de interconexión y las obligaciones de expansión que "es necesario analizar detalladamente", habida cuenta del proceso de Consulta Unificada para la Concesión de Licencias. En el prefacio del documento de consulta se sugiere que el propósito de la Consulta Unificada para la Concesión de Licencias es analizar "diferentes aspectos de la concesión de licencias, la reglamentación y las reglas de juego equitativas que facilitan una Concesión Unificada de Licencias para los servicios básicos y celulares".

En la Consulta Unificada para la Concesión de Licencias se dice que "debido a los desarrollos tecnológicos y a la reducción de los costos de los últimos años, la telefonía inalámbrica ha dejado de ser un producto de lujo para convertirse en un producto de consumo básico". Asimismo, se indica que "cuesta mucho menos instalar una red inalámbrica que una alámbrica, lo que ha impulsado incluso a los operadores tradicionales a adoptar estrategias de expansión basadas en la tecnología inalámbrica, tal como se observa en el suministro de servicios WLL con movilidad limitada, por ejemplo WLL (GSM) por parte de BSNL y MTNL".

En la Consulta Unificada para la Concesión de Licencias se aborda el tema del cambio de las condiciones de competencias en el mercado de telecomunicaciones de la India y se señala que "en estos momentos el servicio de telefonía básica (alámbrica e inalámbrica) y telefonía celular están compitiendo entre sí". Más adelante se desarrolla este punto en mayor medida:

*"Gracias al gran desarrollo que han experimentado las tecnologías inalámbricas, la competencia entre los proveedores de servicio de telefonía básica y telefonía móvil celular es cada vez más ardua y las diferencias que existen en este mercado están desapareciendo. Además, los actuales cambios tecnológicos permiten ya que las tecnologías alámbricas presten servicios de valor añadido que no podían prestarse en el pasado. La disponibilidad de tarjetas de previo pago baratas para ambos servicios acelerará aún más la convergencia de estos dos servicios."*

En la Consulta Unificada para la Concesión de Licencias se señala que "aunque la competencia es cada vez mayor, por razones de asequibilidad en la reglamentación se ha tenido que fijar un límite en cuanto al procedimiento de concesión de licencias y la estructura de las tarifas, tratándose de las llamadas locales y los alquileres mensuales a que dan lugar los servicios básicos". Así pues, "aunque cada vez hay más competencia entre los servicios (tecnologías), las condiciones de los regímenes de tarificación aplicables son diferentes".

Puede sorprender que, si bien el tema de fondo del documento se centra en cuestiones relacionadas con la posibilidad de comparar la competencia y la reglamentación de los precios, el principal objetivo de la Consulta Unificada para la Concesión de Licencias es recabar comentarios sobre si se deben armonizar o no muchos otros aspectos de las condiciones de licencia:

- cánones de entrada en el mercado;
- zona de servicio;
- distribución de la red;
- obligaciones de expansión;
- garantía bancaria de cumplimiento;
- política de espectro;
- atribución de espectro;
- nivel de competencia;
- interconexión con otros proveedores de servicios;

- selección del operador NLD por parte del abonado;
- periodo de validez de la licencia;
- plan de numeración;
- diferentes tecnologías móviles.

En la Consulta Unificada para la Concesión de Licencias sólo se abordan los factores relacionados con el régimen de concesión de licencias en la India para los BSO y los operadores de telefonía celular, habida cuenta de la experiencia de algunos países como Malasia y Singapur en cuanto a la aplicación de un plan unificado para la concesión de licencias. El nuevo marco de reglamentación de la Unión Europea ha servido también como precedente para adoptar un enfoque más coherente en lo que concierne a la concesión de licencias en la India.

No obstante, una preocupación subyacente en ese documento de consulta es la forma de sentar bases que lleven a consolidar y modernizar la estructura actual del sector de telecomunicaciones de la India, especialmente entre los operadores de telefonía celular y los nuevos operadores de BSO. Es posible que gracias a una perspectiva más unificada del mercado y centrada en la promoción de la convergencia y la intercambiabilidad de los operadores de servicios fijos y móviles se creen condiciones más flexibles y favorables para efectuar un análisis de los efectos de la consolidación de la industria en la competencia. También es probable que un análisis más pragmático y realista del funcionamiento de la competencia en el sector de telecomunicaciones de la India acelere la muy necesaria reestructuración de la industria.

Es posible que una reestructuración de este tipo no haga solamente que los nuevos operadores se consoliden, sino que permitan además la creación de empresas mixtas de operadores públicos y privados. Resulta probable que estos progresos creen un clima nuevo y cada vez más favorable para atraer más inversión en el sector de telecomunicaciones de la India. Si el presente análisis del plan unificado para la concesión de licencias da lugar a que las condiciones para proceder a la consolidación sean más flexibles, dicho plan podría contribuir a asentar en nuevas bases el actual régimen de reglamentación de precios. Estas perspectivas podrían ser de gran ayuda para el reequilibrado de las tarifas y llevar a la conclusión de que con el tiempo el plan ADC no tendrá mucha importancia en el marco de reglamentación general de la India.

## **VI. Algunas observaciones sobre el proceso**

En este breve análisis no hemos insistido en las importantes iniciativas en que se basan los diferentes documentos sobre reglamentación del TRAI que aquí se discuten. Muchos de estos documentos tienen como objetivo recabar comentarios de los actores de la industria y sentar las bases para llegar a un consenso sobre las nuevas iniciativas de importancia. En algunos de estos documentos se describen las medidas adoptadas por el TRAI para utilizar lo que el Organismo denomina procedimientos de "participación general" para obtener información de las partes interesadas, en particular los grupos de consumidores. Durante el establecimiento de un nuevo régimen de interconexión, el TRAI creó un comité técnico que se encarga de las cuestiones de detalle que promueve la definición de los problemas suscitados por la interconexión.

Los documentos de consulta del TRAI son un reflejo del compromiso que se ha adoptado para utilizar métodos de cálculo de costos de arriba abajo, de abajo arriba, y de "afuera hacia adentro" o métodos de referencia, en la fijación de precios y costos, tratándose de las tasas de origen, de terminación, de tránsito y del cálculo de las ADC. La Consulta en materia de costos ofrece una evaluación detallada de la utilización de estos tres métodos para establecer las tasas por utilización de la interconexión. En resumen, no cabe duda de que los documentos preparados por el TRAI en los últimos dos o tres años, pese a centrarse en algunos aspectos inherentes al sector de las telecomunicaciones de la India, constituye un documento de referencia importante que deben tener en cuenta otros reguladores de mercados grandes (o pequeños) enfrentados a problemas similares de liberalización y convergencia<sup>1</sup>.

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1 Véase el sitio web del TRAI que normalmente trata de este tema [www.trai.gov.in](http://www.trai.gov.in).



Entre los documentos de consulta fundamentales que revestirían interés para otros reguladores nacionales enfrentados a problemas similares, cabe citar:

- el documento de consulta con fecha de 14 de diciembre de 2001, sobre cuestiones relacionadas con la interconexión entre proveedores de acceso y operadores de larga distancia nacional<sup>2</sup> (la "Orden sobre Interconexión de Operadores"), que se adjunta como Anexo 1;
- el documento de consulta con fecha de 23 de septiembre de 2002, sobre tarifas aplicables a los servicios básicos<sup>3</sup> (en el que se incluyen los acuerdos de tasación por utilización de la interconexión y la tarificación por déficit de acceso) (la "Consulta sobre Tarificación"), adjunto como Anexo 2;
- la 24ª Enmienda a la Orden sobre Tarifas de Telecomunicaciones, de 1999, con fecha de 24 de enero de 2003<sup>4</sup> (la "Orden sobre TT"), adjunta como Anexo 3;
- la normativa de telecomunicaciones con respecto a las tasas por utilización de la interconexión (IUC) con fecha de 24 de enero de 2003<sup>5</sup> (la "Orden sobre IUC"), adjunta como Anexo 4;
- el documento de consulta sobre la implementación de la reglamentación de las IUC, con fecha de 15 de mayo de 2003<sup>6</sup> (el "Documento de Consulta sobre las IUC"), adjunto como Anexo 5; y
- documento de consulta sobre la concesión de licencias unificadas para los servicios de telefonía básica y celular, con fecha de 16 de julio de 2003<sup>7</sup> (la "Consulta Unificada para la Concesión de Licencias"), adjunto como Anexo 6

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2 Disponible en el sitio web del TRAI: <http://www.trai.gov.in/consultation.htm>.

3 Disponible en el sitio web del TRAI: <http://www.trai.gov.in/consultation.htm>.

4 Disponible en el sitio web del TRAI: <http://www.trai.gov.in/torders.htm>.

5 Disponible en el sitio web del TRAI: <http://www.trai.gov.in/Notificationfy.htm>.

6 Disponible en el sitio web del TRAI: <http://www.trai.gov.in/consultation.htm>.

7 Disponible en el sitio web del TRAI: <http://www.trai.gov.in/consultation.htm>.

## **ANEXO 1**

Consultative Paper dated December 14, 2001 on issues relating to interconnection between access providers and national long distance operators (the “Carrier Interconnection Order”).

<http://www.trai.gov.in/consultation.htm>

**Consultation Paper No. 2001/5**

**Telecom Regulatory Authority of India**

**Consultation Paper**

**On**

**Issues Relating to Interconnection between**

**Access Providers and National Long**

**Distance Operators**

14<sup>th</sup> December 2001, New Delhi

## PREFACE

1. Following the announcement of the New Telecom Policy (NTP) 1999 by the Government, Open Competition has already been introduced in the Basic, National Long Distance (NLD) and Cellular Mobile Services. TRAI has recently issued its recommendations for Open Competition in the International Long Distance (ILD) Service and Government's guidelines on ILD Services are also expected shortly.
2. As result of introduction of Open Competition in various service sectors, the Indian Telecommunication sector is now headed towards a Multi-operator Multi-service scenario. Interconnection in such a scenario is going to be rather complex and a number of issues are required to be adequately addressed so that fruits of the competition are available to the telecom users in the form of high quality services at competitive prices. Interconnection is the key to the success of Open Competition. TRAI through this Consultation Paper is attempting to address various issues relating to Interconnection between Access Providers and National Long Distance Operators.
3. The objective of this public consultation is:
  - (a) to develop a General Framework for Interconnection (GFI) in the context of private NLD Operators' entry into the Telecom service market;
  - (b) to evolve a methodology for charging carriage of a Long Distance call in a Multi-operator environment i.e., when more than two operators are involved, in the light of the best International practice.
  - (c) to discuss issues relating to Equal Ease of Access by subscribers to the NLD Networks particularly relating to Carrier Access Code (CAC), Pre-selection and Default Carrier.
  - (d) to present the outline of an Interconnect Billing System for proper reconciliation and settlement of Access Charges between Access Providers i.e., BSOs / CMSOs and National Long Distance Operators, and to discuss various issues relating to the same.
4. This paper also seeks to generate discussion / views on the framework of a typical Interconnection Agreement as published in ITU's Publication on Interconnection Regulation. The objective would be to get the different stakeholders views on its applicability in the Indian conditions, in parts or as a whole. The paper also reproduces for ready reference, extracts relating to Interconnection and Interconnect Billing from Licensing Agreements of Access Providers and NLDOs. Extracts from Interconnection Agreements, TRAI's Recommendations on Carrier

Selection of National Long Distance Calls have also been made available. International practices on various Interconnection issues find a place in the paper and where considered helpful, references to certain relevant important documents, especially from other International Telecom Regulators have also been made.

5. The Authority intends to issue its Regulations on Interconnection issues relating to the Multi-operator scenario in a time-bound manner and would therefore like to have the comments and views on any or all issues raised in this paper on or before 14<sup>th</sup> January, 2002. TRAI would be conducting a few Open House Sessions for all stakeholders including consumers / consumer organisations. A separate Open House discussion with the Access Providers and the NLDOs is also proposed, to discuss various technical issues, in more detail.
6. For further clarifications, Adviser (Fixed Network Division), TRAI may be contacted on telephone number: 6166930. The Fax number is 6103294 and E-Mail is: [traio6@bol.net.in](mailto:traio6@bol.net.in). Written submissions accompanied by floppy diskette having the contents of the submission would be appreciated.

Sd/-  
M. S. Verma  
Chairman

New Delhi  
13<sup>th</sup> December, 2001

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**Note: Annexures marked with \*\* (asterisk) below are not included in the printed document but will be available on TRAI's Web Site**

- I.\*\* ITU-T E-164 Recommendation Supplement 1 "Alternatives for Carrier Selection and Network Identification"
- II\*\* EU's Directive 97/33 on Interconnection in Telecommunication practices on Interconnection Agreements and Charging



## 1. BACKGROUND INFORMATION

1.1 In 1999, the Government announced a New Telecom Policy (NTP'99). Subsequent to the announcement of NTP 99, the Government sought TRAI's recommendation on opening up of the National Long Distance (NLD) segment of the PSTN. Based on the Authority's recommendation, the DOT (Licensor) has recently issued detailed terms & conditions for operating the NLD Service in the country. Extracts of the terms and conditions as far as they relate to the Interconnection are placed in Annexure D. This includes other Interconnection references as appearing in other Licence and Interconnect Agreements.

1.2 The Authority in its recommendation on NLD had recommended setting up of a High Level Technical Committee to sort out various technical issues relating to the Interconnection of Access Provider's (BSOs'/ CMSOs') Network to that of the NLDs. Accordingly, the Authority, in consultation with the DOT, set up a High Level Committee under the Chairmanship of the Secretary TRAI to address various issues on Interconnection. Representatives of the DOT, MTNL, BSNL, VSNL, TEC, Associations of Basic and Cellular Mobile Operators and TRAI are members of the Committee. The Committee has given a number of recommendations to the TRAI, which have helped the Authority in its decision making process.

1.3 The Authority had issued the Telecommunications Interconnection Charges and Revenue Sharing Regulation'99 (Annexure C) specifying Interconnection Charge i.e. for 'Port' & 'Leased Lines' required to terminate Interconnection links between the Network of the Interconnection seekers and that of the Interconnection givers. The Interconnection Regulation issued by the Authority defines the following three types of Costs/ Charges:

i) **Set-up Costs** i.e. all costs required for initially linking up two Networks and making that link operational (including inputs such as fibre links, ports, building space and any up-gradation of equipment, as well as software required to make the Interconnection operational)

ii) **Interconnection Charges** are the (recurring) amounts payable for the link, ports and other resources as indicated at i) above;

iii) **Usage Charges** are payments for use of the Network for transmission of telecommunications messages by the subscriber of the Interconnection seeker. The mode of payment of such charges includes, *inter-alia*, revenue sharing arrangements.

1.4 Although Interconnection regulation of May'99 specifies Port charges, Leased line charges as well as usage charges for all types of calls including domestic long distance and International calls, it needs to be reviewed because it was issued before the NLD licensing regime, keeping in view only two Networks involved in conveyance of a long distance call i.e. that of basic

service operator providing the originating carriage service, and that of the DOT (now BSNL) providing both transit and terminating carriage services. The Authority, therefore considers it necessary to develop a general framework for Interconnection in the context of NLD operator's entry in to the telecom service market so as to provide a basis for Interconnection between Access Provider's Network and that of the new entrant NLD operator.

1.5 The objective of the public consultation is:-

- (e) to develop a General Framework for Interconnection (GFI) in the context of private NLD Operators' entry into the Telecom service market;
- (f) to evolve a methodology for charging of Origination, Transit and Termination carriage of a Long Distance call in a Multi-operator environment i.e., when more than two operators are involved, in the light of the best international practice.
- (c) to discuss issues relating to Equal Ease of Access by subscribers to the NLD Networks particularly relating to Carrier Access Code (CAC), Pre-selection and Default Carrier.
- (d) to present the outline of an Interconnect Billing System for proper reconciliation and settlement of Access Charges between Access Providers i.e., BSOs/ CMSOs and NLDOs.

## **2. GENERAL FRAMEWORK OF INTERCONNECTION**

### **2.1 Inputs from other countries / ITU Guidelines**

2.1.1 The global practices suggest that the structure and level of Interconnection charges often determine whether competitors will be financially viable. Efficient technical arrangements for Interconnection are considered as one of the most important pre-requisite for sustainable competition. These arrangements should specify gateway functions to be performed at Network-Network Interfaces such as those relating to Signalling, generation of Call Data Records (CDRs) by Transit Switches for Interconnection Billing as well as Points of handing over traffic by one operator to another, in conformance with Fundamental Technical Plans.

2.1.2 International experience shows that the Incumbent operators generally have little incentive to make Interconnection easy for their new competitors, as it may be contrary to their immediate corporate interests to provide full, open and low cost Interconnection on a timely basis. When negotiations do occur, the incumbent operators usually retain most of the bargaining power. Regulators in such a scenario are expected to play a central role in ensuring that the National Interconnection Framework becomes more competitive.

2.1.3 The latest ITU publication on Interconnection indicates that more than 101 countries have established Interconnection Regulatory Framework in some form or the other relying upon a host of measures such as legislation, license provisions, executive orders, directives, guidelines and determinations.

2.1.4 In addition to National Regulatory Frameworks, a number of Regional groups have begun developing common approaches to Interconnection. European Union (EU) has Interconnection directive to be incorporated into the national laws of its 15 member states. Asia Pacific Economic Cooperation (APEC), Inter-American Telecommunication Commission (CITEL) and Telecommunications Regulators Association of Southern Africa (TRASA) are also working towards global harmonisation approach for Interconnection. The Malaysian Regulator has recently issued a General Framework of Interconnection, to facilitate detailed negotiations between Operators.

2.1.5 Many countries have favoured a policy of industry negotiation on Interconnection Agreements and are allowing operators to seek Regulatory intervention for dispute resolution if negotiations fail. However, there appears to be a growing consensus that advance regulatory guidelines – or even specific Interconnection rules – may be necessary to establish the proper environment to facilitate Interconnection.

2.1.6 It is becoming clear that the lack of advance Regulatory Guidelines may have some serious drawbacks. Without Guidelines, Interconnection negotiations are frequently protracted, delaying the introduction of competition. This leads to regulatory uncertainty and discourages investment.

Interconnection arrangements that are negotiated in such an environment often reflect the unequal bargaining power of the incumbent operator and may not be optimal for developing an efficient competitive market place.

2.1.7 The issue, of whether to establish binding Rules or Regulatory Guidelines, is often described in terms of ex-ante versus ex-post regulation. An ex-ante framework involves setting in advance, clear and possibly detailed, sector-specific rules for all market players to follow. An ex-post model, by contrast, gives market players substantial freedom and flexibility to act in the market, punishing any transgressions of telecommunication or general competition law only after they occur.

2.1.8 Many countries have adopted ex-post model but actually practice ex-ante, sector-specific regulation. That is to say that policy-makers generally agree that in truly competitive market, Interconnection Agreements should be left to market forces and commercial negotiation. But in viewing their own markets, very few policy-makers have concluded that Interconnection markets are sufficiently competitive to warrant pure ex-post regulation.

## **2.2. Making the Dominant Operator responsible for offering Interconnection on Cost based Principles to new entrants.**

2.2.1. Some countries seeking to introduce competition, require “Dominant” Carriers i.e, the former monopoly operators of the Public Switched Telephone Network who are also the dominant NLDO, to Interconnect with the other Carriers such as Access Providers (BSOs / CMSOs), based on a regulator approved Reference Interconnection Offer (RIO). One such example is Singapore, where the Regulator i.e., the Info-Communications Development Authority (IDA) has mandated that the Dominant Carrier i.e. SingTel to prepare a RIO, based on which, the new entrants can seek Interconnection.

2.2.2 The Singapore RIO is in two Parts. The first outlines the procedures necessary to accept the RIO and enter into a RIO Agreement with SingTel; the second includes the minimum terms and conditions on which SingTel will enter into such an Agreement with Telecommunications Licensees. A Requesting Licensee, that has notified SingTel that it wishes to negotiate an Individualised Agreement, may obtain Services on the prices, terms and conditions specified in this RIO on an interim basis pending the adoption of the Individualised Agreement, either as a result of voluntary agreement or the dispute resolution procedure.

2.2.3 Basically, the Dominant Operator is required to publish the cost of unbundled network elements and services, based on which the new entrants can avail his Network Carriage services, such as Origination, Transit and Termination. Similar approach has been adopted in the UK, where the Regulator (OFTEL) has mandated the Dominant Carrier i.e. British Telecom (BT), to publish Accounting Statements showing the cost of unbundled network elements involved in call conveyance from the Point of Entry to the Point of Exit

on the BT network, to determine the charges of using the BT Network i.e, per mile-minutes (MM) of use of various elements. The format used by BT to show the unbundled network elements involved in call conveyance, as well for Interconnection of links, is placed at Annexure L.

### **2.3 Key Items in an Interconnect Agreement**

An orderly Interconnection regime is extremely important for the healthy growth of the telecommunications sector. There are many complex aspects and settlement of these issues is an ongoing activity. The Authority is of the view that the following key items should be elaborated in full details in an Interconnection Agreement to be signed between Access Providers and National Long Distance Operators:

- a) Scope and definition of services;
- b) Interconnection and POI requirements and principles;
- c) Provision of all relevant technical information;
- d) Interconnection provisioning procedures;
- e) Network and transmission capacity requirements;
- f) Technical service level commitments;
- g) Technical specifications and standards;
- h) Transmission and performance standards;
- i) Fault reporting and resolution procedures;
- j) Network management, maintenance and measurement procedures;
- k) Network integrity, safety, protection and related matters;
- l) Call routing, handling and operations procedures;
- m) Access to Interconnection gateway facilities and sharing of infrastructure;
- n) Charging mechanisms, billing and settlement procedures;
- o) Transmission of calling line identification (CLI) information;
- p) Operator assisted services, directory information and assistance;
- q) Commercial terms and conditions;
- r) Provision for contribution to the cost of local access;
- s) Fundamental Technical Plans;
- t) Confidentiality of information;
- u) Liability and indemnities;
- v) Provision for an Interconnection Agreement liaison and co-ordination Committee; and
- w) Review periods and terms for review
- x) Quality of Service

### **2.4 Provisions of the Licence Agreements issued to NLD / BSOs relating to Interconnection:**

2.4.1 Since the Interconnection Agreement will have to be finalised within the framework of the existing Licence regime, the relevant clauses from

agreements between Licensor and Licensee (BSOs/NLD) are brought out in the following sub-sections for ready reference and also to provide the general framework of Interconnection. Clauses 2.4, 2.5 and 17.5 of the Licence Agreement for provision of Basic Service (new players) and the DOT, stipulates that:

*“Clause 2.4 It shall be mandatory for the LICENSEE to provide Interconnection with National Long Distance (NLD) Service Providers, through suitable mutual arrangements / agreements, where by the subscribers could have a free choice to make Inter-Circle / International Long Distance Calls through any NLD Service Provider. For International Long Distance Calls, the LICENSEE shall access International Long Distance OPERATOR through National Long Distance Operator only. Similarly, inter-circle leased lines are to be provided by suitable mutual agreements / arrangements with NLD Service Providers.*

*Clause 2.5 Direct Interconnectivity among all Telecom Service Providers in the licensed SERVICE AREA is permitted. LICENSEE shall Interconnect with Cellular Mobile Telephone SERVICE PROVIDER at the station Gateway Mobile Switching Centre (GMSC) or Mobile Switching Centre (MSC), unless mutually agreed otherwise, subject to compliance of prevailing regulations, directions or determinations issued by TRAI under TRAI Act, 1997”*

Clause 17.5 “The LICENSEE may enter into suitable arrangements with other Service providers to negotiate Interconnection Agreements whereby the Interconnected Networks will provide the following:

- a) To connect, and keep connected, to their applicable systems,
- b) To establish and maintain such one or more Points of Interconnect as are reasonably required and are of sufficient capacity and in sufficient numbers to enable transmission and reception of the messages by means of the applicable systems,
- c) To meet all reasonable demands for the transmission and reception of messages between the Interconnected systems.

2.4.2 The TRAI had issued a detailed Regulation on Interconnection in May 99, which gives certain general principles of Interconnection. These mainly relate to - non-discrimination, timeliness, unbundling and payment only for elements which are required and costs based price based on Directly Attributable Incremental Costs.

The Telecommunication Interconnection (Charges and Revenue Sharing) Regulation 1999 (1 of 1999) lays down the following general framework for Interconnection:

- Interconnection charges shall be cost based, unless as may be specified otherwise.
- For determining cost based Interconnection charges, the main basis shall be "incremental or additional" costs directly attributable to the provision of Interconnection by the Interconnection provider.
- No service provider shall discriminate between service providers in the matter of providing Interconnection and levying of charges thereof.

Provided that a different charge may be levied if justified on the basis of a substantial difference in costs incurred for providing that particular Interconnection.

## **2.5 ITU's Typical Interconnection Agreement**

Contents of a Typical Interconnection Agreement contained in the ITU's publication "**Trends in 2000-2001 : Telecommunication Reform : INTERCONNECTION REGULATION**" which will hopefully provide a framework for negotiations between APs and NLDs for entering into an Interconnection Agreement, are placed at Annexure A for ready reference and soliciting the comments of the stakeholders.

2.6 In many countries, time frames are set for Interconnection provision. There are provisions for penalties in the event of delays in Interconnections. Annexure 'B' is having one such set of details covering the provisions made by some of the courtiers in the American Region.

## **2.7 Technical Interfaces between Access Providers' Network and National Long Distance Operators' Network**

2.7.1 Best International practice mandates each of the Interconnecting parties provide, Interconnection of comparable technical and operational quality as is applicable between their own structurally separate NLD/ BSO/ CMSO Networks.

2.7.2 Some of the relevant considerations applicable to technical interfaces between APs' Network and NLD Network are as follows:

- a) Compliance with National standards. Where such standards for Interconnection interfaces do not exist, ITU standards may be used as long as the arrangements do not restrict Interconnection by other licensees;
- b) the offering of technical and operational Interconnection facilities should be on the basis of unbundled Network elements (UNE);
- c) Network operators should plan for adequate switching and transmission capacities to Interconnect with other Networks without undue delay;
- d) need for a reasonable lead times for provisioning of Network resources to the other party;
- e) the need for the Network to Network Interface (NNI) to conform to the Fundamental Technical Plans such as Numbering, Signalling, Synchronisation and Charging;

- f) the timely and efficient deployment of sufficient resources such as number of time slots in E1 links connecting the two Networks to meet the specified Grade of Service (GOS) on the NNI;

## **2.8 Questions**

A number of questions arise in the context of the points brought out in this Section. These are listed below:

2a) In the event that the Interconnection Provider and Interconnection seeker are not able to reach an Agreement, whether the Regulator should step in suo-moto or should his intervention be only at the request of one or both the parties?

2b) Does the TRAI's Telecommunication Interconnection Regulation of May 99 need any amendment(s) in the light of the latest ITU publication "Trends in Telecommunication Reform 2000-2001 Interconnection Regulation"/ the licenses issued by the DOT to BSOs/ NLDOs? If the answer is yes, what are the suggested modification(s) to the Regulation.

2c) What should be a reasonable time for the Interconnection provider to give the requested resources such as leased line/ ports etc to the Interconnection seeker? In case of an Interconnection Provider's failure to adhere to the given time-frame, what corrective or remedial measures should be stipulated?

2d) Should the Regulator in India mandate the dominant Operator i.e., BSNL to publish a Reference Interconnect Offer (RIO) document containing Un-bundled Network Element (UNE) costs so that the Interconnection charges are settled without any undue delay, based on principles enunciated in the May 99 Regulation of TRAI?



### **3. Methodology for calculating Origination, Transit and Termination Carriage Charges in a Multi-Operator Environment**

#### **3.1 Revenue Sharing on the basis of Origination/ Transit/ Termination carriage charges:**

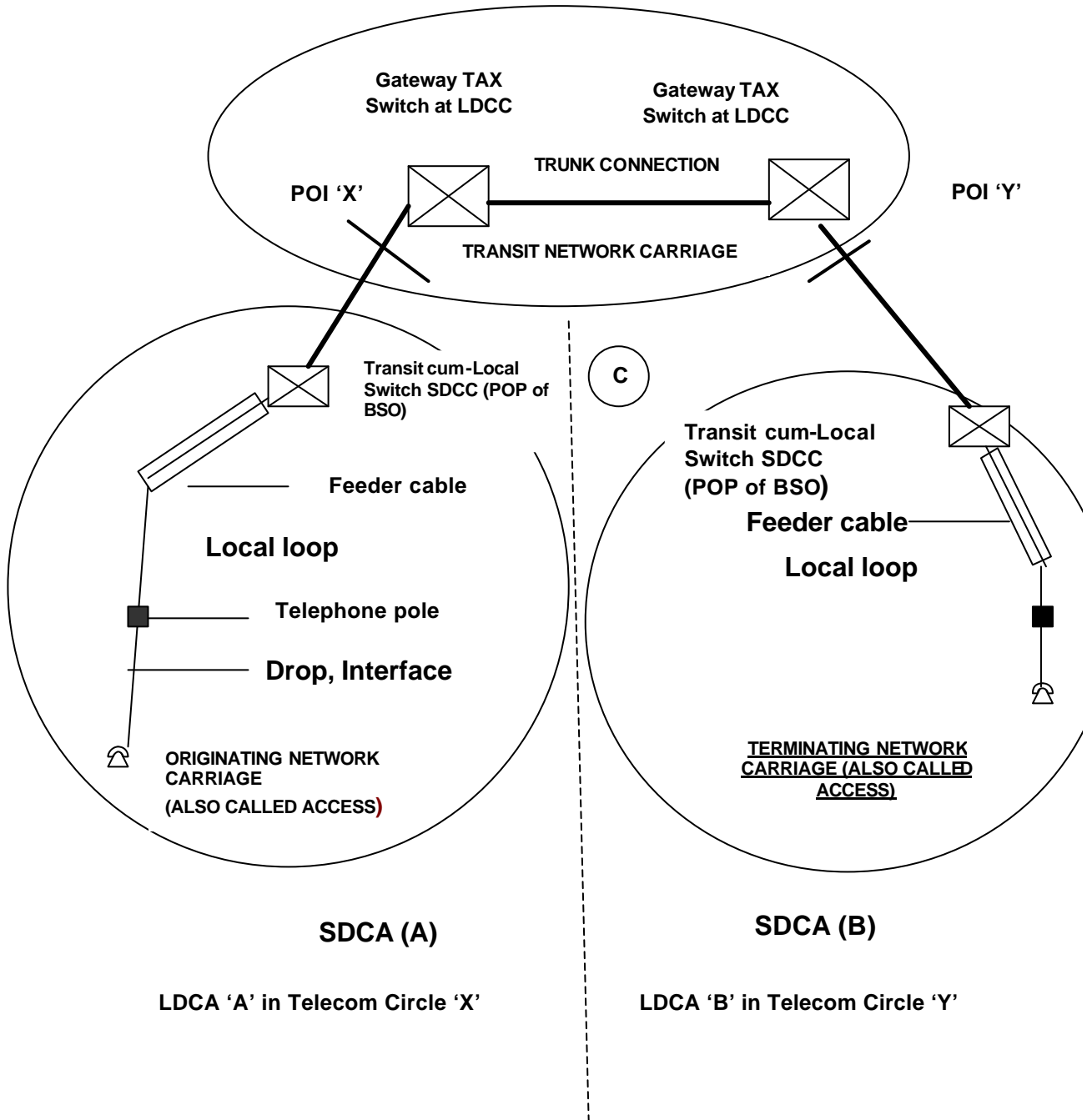
3.1.1 The current sharing of call revenues between private BSOs/CMSOs and the incumbent i.e., BSNL, who presently is the only long distance service provider in the country, is based on “The Telecommunication Interconnection (Charges and Revenue Sharing) Regulation issued by TRAI in May 99. The Explanatory Memorandum annexed to this Regulation contains the following explanation: “To begin with, it must be re-iterated that the revenue sharing arrangements specified in this Regulation are interim, and are not based on detailed cost analysis. Application of an access/carriage charge regime will provide more logically tenable usage charges. That requires a detailed assessment of the underlying costs”.

3.1.2 It will be seen from the above explanation contained in the Interconnect Regulation issued by TRAI in May 99, that the existing call by call access charges, i.e., of 48 p multiplied by MCUs registered on the bulk meters at the POI, paid by BSOs to the Transit and Terminating Carrier i.e., BSNL (erstwhile DOT) and Rs. 1.20 multiplied by MCUs paid by CMSOs to the Transit and Terminating Carrier, will need revision based on ‘detailed cost analysis’. Moreover, the Authority’s Regulation of May 99 was applicable, when the carriage of a long distance call involved only two Networks i.e., one of the APs (BSOs/ CMSOs) and the other of the incumbent. With the induction of the NLDOs, who will provide long distance carriage service between two telecom circles, the total carriage charges from the point of origination to the point of termination, may need to be shared, between at least three operators based on detailed cost analysis of origination, transit and termination, as detailed in the following sub-section.

3.1.3 Figure 3.1 gives the Network elements involved in carrying a call from a PSTN Network in an SDCA (A) situated in Telecom Circle ‘X’ to another SDCA (B) situated in Telecom Circle ‘Y’. Figure 3.2 gives the Network elements in carrying a call from a PLMN Network situated in a Telecom Circle ‘X’ to a PSTN subscriber located in an SDCA ‘B’ of the Telecom Circle ‘Y’.

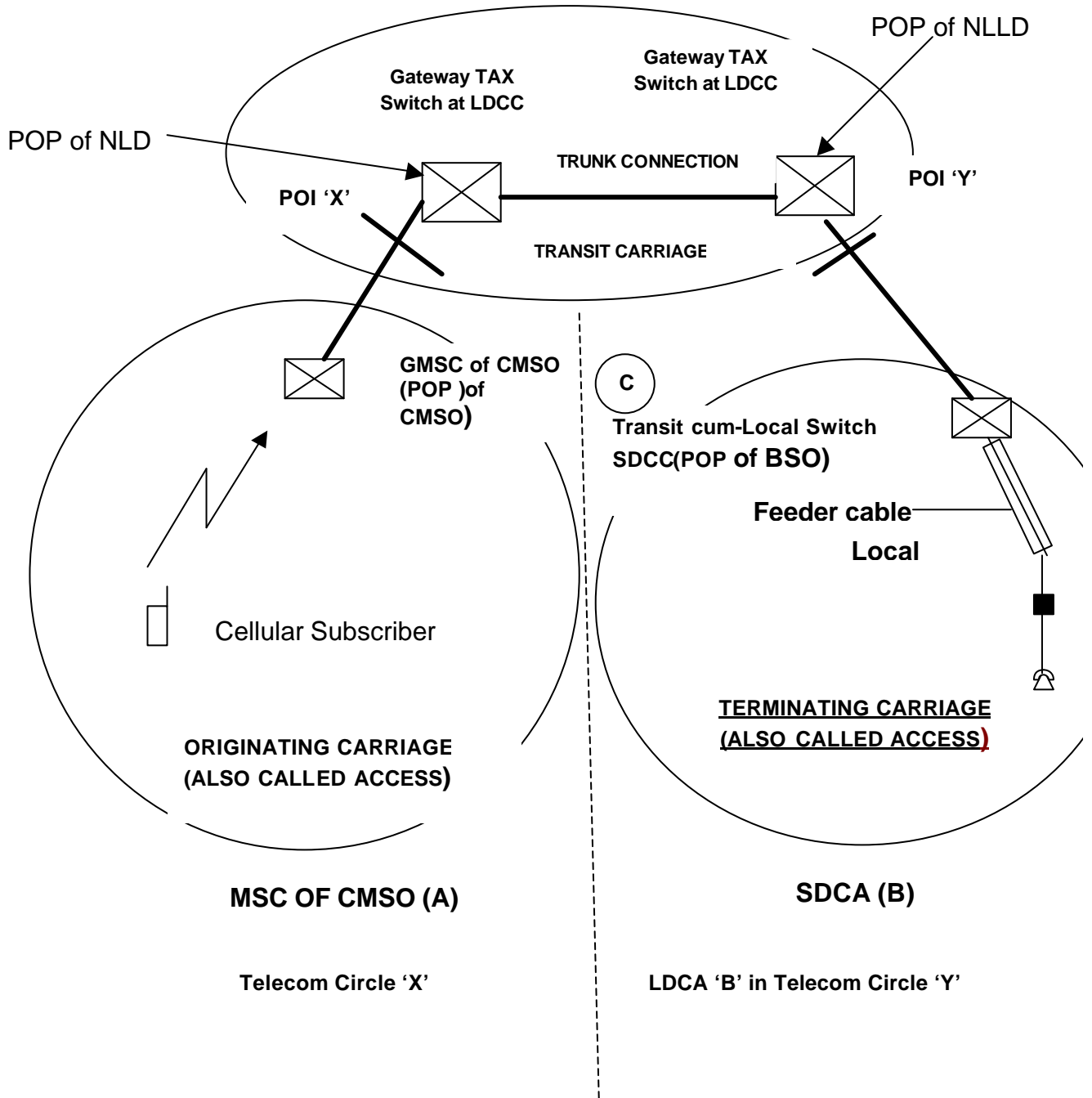
**Figure 3.1**

*Typical Carriage on the PSTN*



**Figure 3.2**

*Typical Carriage of a Call originating in a PLMN and transited / terminated in a PSTN*



3.1.4 Two alternative methodologies for assessing cost based carriage charges in the three Network clouds shown in the Figure 3.1 can be adopted. The first one is based on capturing the distance element between POIs 'X' and 'Y' i.e., on the NLD Network cloud, in real time, in an off line billing system (also called Interconnect Billing System) and categorizing the same in three or four distance slabs and based on the same, deciding the quantum of resources in terms of Network elements used in the three Networks. The cost of the carriage to be determined based on the resources used for the carriage of the call in the three Network clouds. Such a comparative costing of Network elements on the three clouds can hopefully provide a basis for sharing of the collection charges. In general, the Network elements (both switching and transmission) involved in the originating and terminating Networks will not differ significantly, that is to say that the revenue percentage for origination and termination, may be almost equal. However, the revenue percentage for transit carriage provided by the NLD cloud, based on the distance between originating LDCC and terminating LDCC i.e., X – Y will vary call by call, due to dramatic variation in the distance element of each carriage. It may be in the range of 200 Kms in case of neighbouring Circles such as Haryana and Punjab, but in case of J & K and Karnataka, could be greater than 1500 Kms.

3.1.5 Thus, the carriage on the NLD cloud may have to be categorized as suggested below:

- Short haul (upto 200 Kms),
- Medium haul (upto 500 Kms),
- Long haul (upto 1000 Kms),
- Very long (above 1000 Kms):

3.1.6 The average costs of the Network elements involved in the long distance carriage of the above four or five categories will have to be determined either by mutual discussions or regulatory analysis, based on the cost data furnished by the operators involved. Similar cost analysis will have to be done for other types of Network combinations such as PLMN (Originating) – PSTN (Transit) – PLMN (Terminating) or PLMN (Originating) – PSTN (Transit) – PLMN (Terminating) as shown in Figure 3.2.

3.1.7 In so far as revenue sharing on domestic long distance calls originated in cellular mobile Network (PLMN) and terminating in a basic service provider's Network (PSTN) are concerned, the schedule II of the Telecom Interconnection Regulation of May'99 stipulates that the payment to the basic service providers for the long distance carriage will be made at a rate applicable to domestic long distance calls from the point of Interconnect. The number of metered call unit (MCU) shall be measured at the pulse rate applicable to long distance calls from the point of Interconnection to ultimate destination. The cellular mobile operators is permitted to retain airtime charge, which is distance insensitive, for the resources consumed on the PLMN cloud. Subsequently, the Authority has permitted them to retain 5 % of the STD charges collected from the subscribers

as a compensation for billing and bad debt charge vide its determination of 8<sup>th</sup> January 2001. After the induction of private NLD operators, the PSTN carriage may involve the facilities of two PSTN operators, namely as far as transit is concerned, the NLD operator's cloud, and as far as termination is concerned that of the terminating BSOs. The sharing of the STD collection charges between the two operators namely the NLDO and terminating BSO, may have to be done on the same basis as in those cases in which the call is entirely conveyed on the PSTN. In this case also, the cost of carriage on the NLD cloud may have to be determined on the basis of the distance travelled on the NLD clouds i.e. from the point of entry to the point of exit and the distance of carriage involved from the point of entry in the terminating BSOs' Network to its destination. It could perhaps be shared on the same ratio as distance travelled on the two clouds, namely NLD cloud and the terminating BSOs cloud.

3.1.8 It will be seen from the methodology of determining the revenue shares or usage charges on per call basis presented in pre-paras, that a detailed cost analysis of the Network elements involved in the carriage of call from its origin to destination is an essential pre-requisite to determine either the revenue share percentage for the call volumes i.e., minutes of use (MOU) or usage charges on per call basis. The same could vary on call by call basis based on the distance element involved in the three clouds or could be worked out as a percentage of all call revenues (for call volumes) based on average distance of carriage in the respective clouds. The fundamental concepts relating to costing of Network facilities are given below.

## **3.2 Fundamental concepts relating to costing of Network facilities**

### **3.2.1 Fixed and Variable Costs:**

a) In principle, all telecommunication costs can be classified either as fixed or variable. Fixed costs remain constant over time, regardless of how much the Network is used. There are two main types of fixed costs: One-time investment costs, also known as 'Capital Expenditures', and recurring 'Operating Expenses'.

b) Capital Expenditures are generally large purchases of plant and equipment that have a planned useful life of at least four to five years. Such equipment typically includes all major Network switching and transmission facilities. Standard accounting practice calls for converting capital expenditures to recurring expenses as either annual depreciation or amortization charges.

c) Operating expenses are the costs that the operator incurs on a regular basis – monthly or annually, for example. These expenses generally are constant; they do not vary in amount according to the level of Network usage. Operating expenses can be divided into two major categories; fixed operating expenses (including materials and services), and labour expenses such as salaries and employee benefits.

d) Variable costs are directly related to the level of Network usage.

In telecommunication Networks, variable and fixed costs are categorised “Traffic-Sensitive” and “Non-Traffic-Sensitive” costs, respectively.

### **3.3 Cost Study Approaches recommended by ITU:**

a) Cost studies should be as thorough as possible, given the available data. Examination of the costs needs to be made from more than one point of view, to reinforce the accuracy of the results. Three general approaches to cost studies can be pursued, either separately or in combination:

- Top-Down,
- Bottom-Up, and
- Outside-In.

b) Each approach could, in principle, yield meaningful cost results by itself. But in reality, there are likely to be too many data gaps and methodological variances to rely on a single approach. Including all three methods in a single study can yield a range of results that will serve as basis for meaningful conclusions on costs and Interconnection rates.

### **3.4 The Bottom-Up Approach:**

a) According to ITU, this method is arguably the most “accurate” means of measuring unit costs, assuming sufficient data are available. It is based on the idea that service costs can be identified from the facilities and other inputs needed to provide the services. The costs of the inputs are combined in proportion to their utilisation in providing each service, then divided by the number of total units of service, resulting in per-unit facility costs.

b) This approach depends on the availability of complete, disaggregated data on input costs and the relative use of facilities in the provision of different services. This can be analysed on a historical-cost basis or a forward-looking incremental cost basis, but any result expressed as pure, incremental facility-based unit costs must be reconciled with joint and common costs and administrative overheads.

c) Figure 3.3 explains the Bottom-Up Approach.

### **3.5 The Top-Down Approach:**

a) As per ITU recommendation, the Top-Down approach begins with aggregate, company-wide cost data such as total annual expenditures, capital investments and operating costs. Ideally, such costs will be tracked according to some general categories, such as whether they are capital or operating costs. The goal of a top-down study is to take these aggregate costs and

allocate them among all services provided by the carrier. The advantage is that this method assures that all of the carrier's costs are accounted for. The difficulty, on the other hand, is determining an economically justifiable allocation formula.

b) The most appropriate use of top-down analysis is as a check and comparison against a comprehensive bottom-up, incremental cost analysis. Unfortunately, such a complete bottom-up analysis is rarely possible because of a lack of adequate data. Aggregate company costs, by contrast, are usually available. As a result, the top-down analysis often becomes an integral part of the cost study and is used to estimate capital and operating costs where exact facility input data are unavailable

c) The Australian Competition and Consumer Commission (ACCC) uses a form of top-down analysis – dubbed a “full-cost approach” – as an option for settling Interconnection disputes. The analysis is used to arrive at Total Service Long Range Incremental Cost (TSLRIC) results, which depend upon extensive carrier record data.

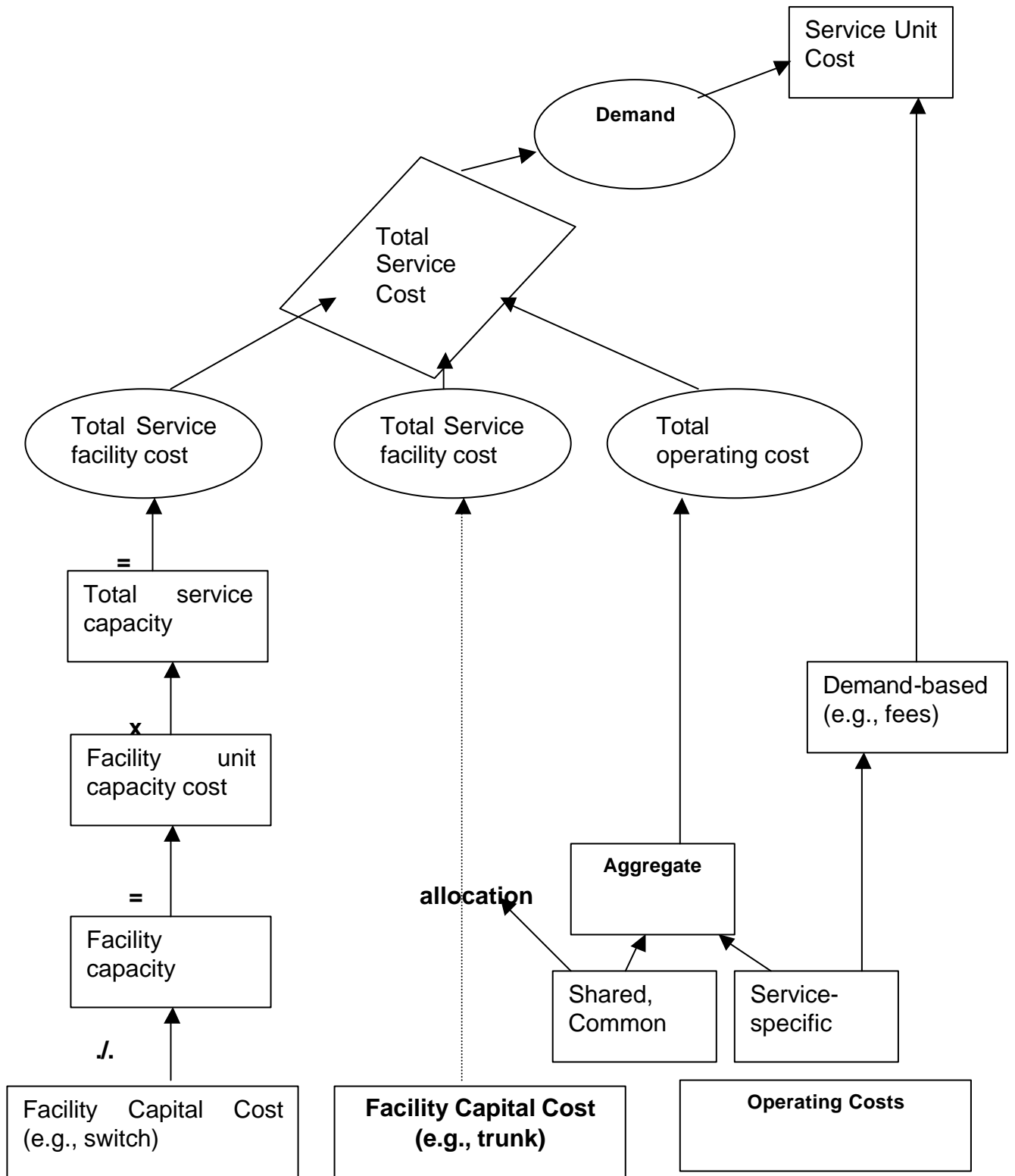
Figure 3.4 explains the Top-down Approach.

### **3.6 The Outside-In Approach:**

a) The third approach is to use “proxy” estimates from outside sources, establishing cost “benchmarks”, or ranges of costs, for services or facilities. This involves two steps. First, the regulators must define the appropriate cost elements and the scope of cost comparisons – whether they will be comparisons of specific facility costs, operating unit costs or service-wide costs. Second, the results have to be adjusted to account for differing conditions between the subject country and the benchmark country.

b) Figure 3.5 explains the Outside-In Approach.

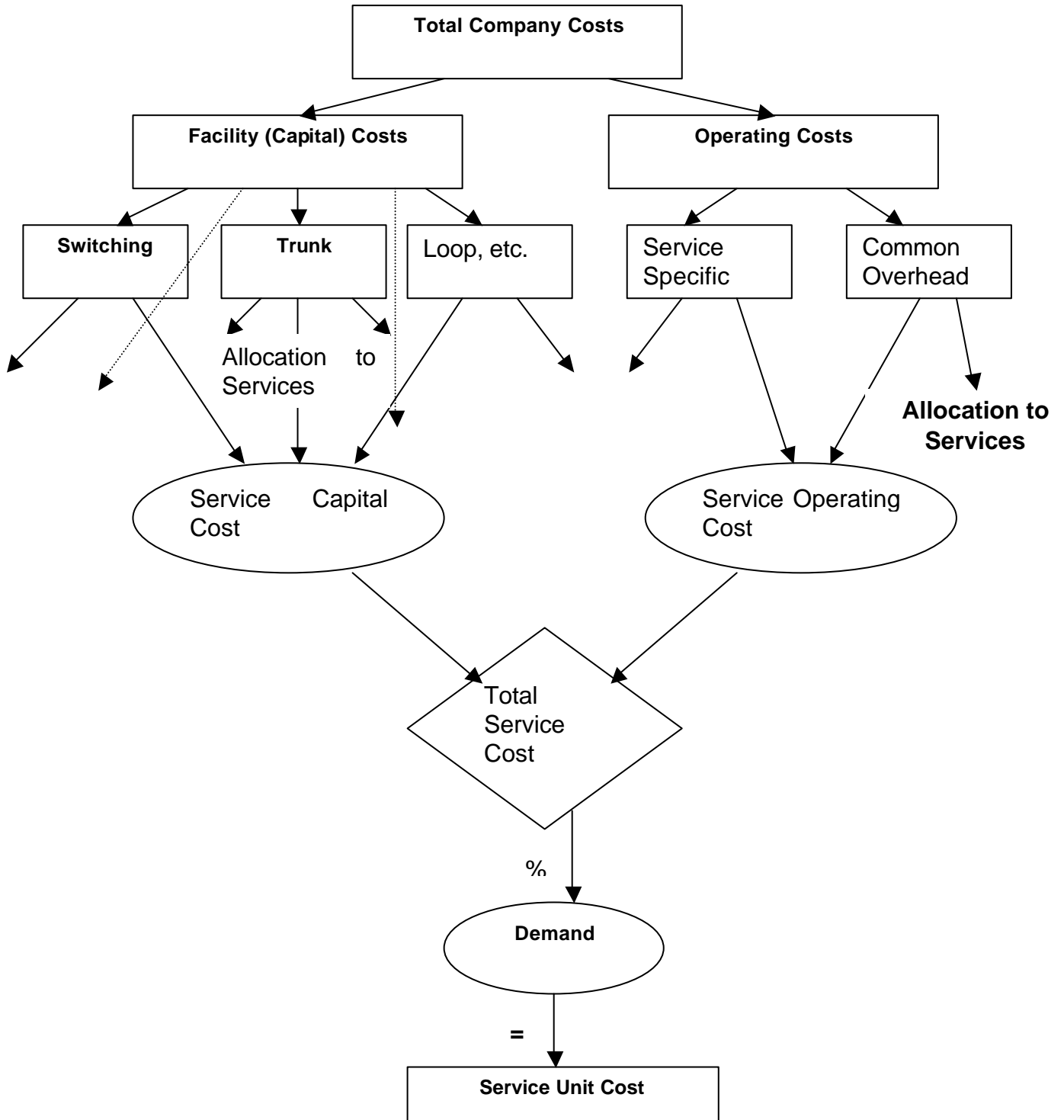
**Figure 3.3 Bottom-Up Analysis:**



Source: ITU – Trends in Telecommunication Reform 2000-2001

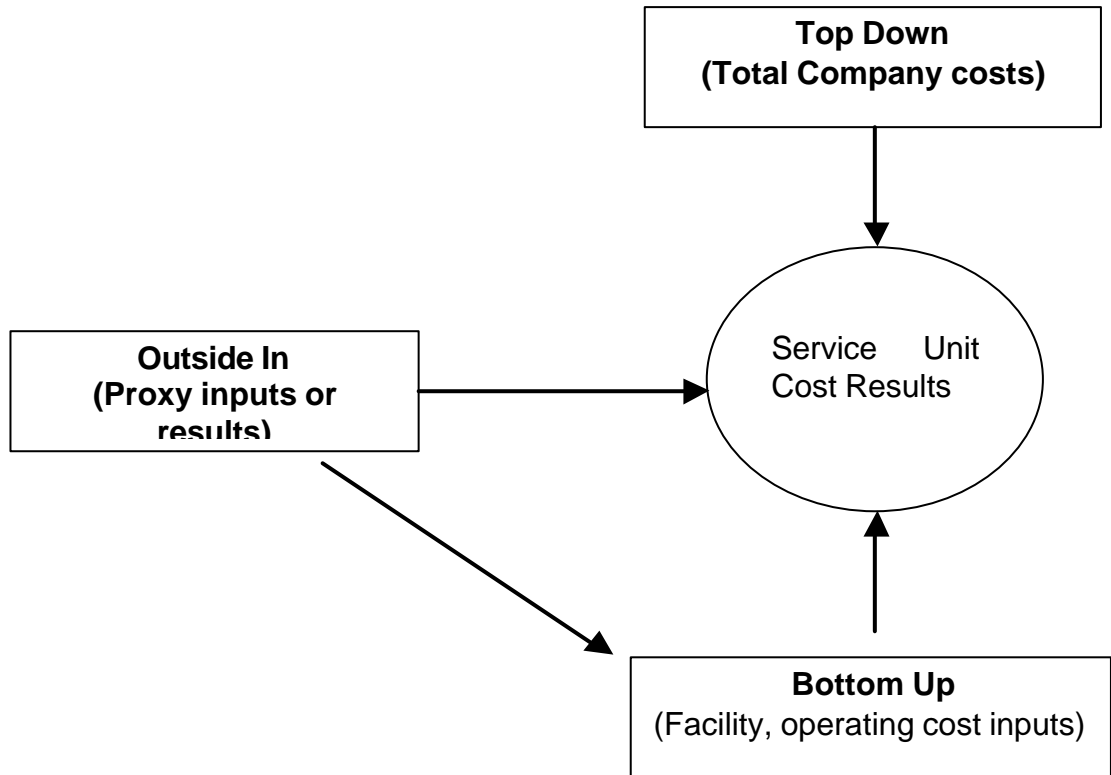


**Figure 3.4 Top-Down Analysis:**



Source: ITU – Trends in Telecommunication Reform 2000-2001

**FIGURE 3.5 OUTSIDE-IN APPROACH:**



Source: ITU Trends in Telecommunication Reform 2000-2001 (Interconnection Regulation)

3.7 **Questions:** Views of the stakeholders are solicited on the following issues, based on the discussions in this section.

3. a) Which of the three costing Approaches referred in Section 3.4 to 3.6 above would be appropriate for adoption in our present Indian Telecom environment?

3 b) Whether the Revenue Sharing methodology for Long Distance calls should be based on call by call assessment of cost of Originating, Transit and Terminating Carriage? Would it be correct to assume that the distance elements involved in the Originating and Terminating carriages are on an average, almost equal? Can we fix equal percentage say 'X' for origination and Termination and 'Y' for Transit. Both 'X' and 'Y' to vary based on the Cost of Carriage incurred on the three Network segments i.e. Originating, Transit and Terminating?

3 c) What would be the most acceptable way to work out Revenue Share percentages, when there are more than one NLDOs involved in Carriage of a Long Distance call between two Telecom Circles?

3 d) What Revenue Sharing methodology should be adopted in case of International Long Distance Calls for scenarios when ILD traffic is

- Delivered through NLDOs
- Delivered directly to ILDO by Access Providers

## **4. DISCUSSION ON ISSUES RELATING TO EQUAL EASE OF ACCESS**

### **4.1.1 Dialling Parity**

a) If conditions for healthy competition are to be established, telecommunications end users should be able to access the services of new market entrants as easily as they can access those of the incumbent operators. Without equal – or at least comparable – ease of access, new entrants will find it difficult to attract customers. For example, in the early days of long distance competition in Canada and the United States, many customers found it inconvenient to use competitive operator's services because of the need to dial more digits than what would be required if the STD call is dialled through the incumbent's network.

b) US policy-makers addressed that problem by requiring dominant local exchange carriers to offer equal access for long distance carriers to reach potential customers. That regulatory solution also included the information of 'Pre-subscription' for Long distance services, allowing US customers' calls to be routed automatically to their chosen carriers.

c) Today, many incumbent operators and telecommunications equipment manufacturers have redesigned their switches and related software, making them very easily adaptable to the requirements of multi-operator environment. Dialling parity is thus fairly painless to achieve with the right software package. Nevertheless, implementing dialling parity usually requires incumbent carriers to alter their operating procedures and reprogram their equipment. There are basically two approaches to providing equal access:

### **4.1.2 Call-by-Call Carrier selection:-**

a) Customers select the operator of their choice for each call by dialling a short code or prefix unique to their selected operator. For example, in Colombia, customers dial "09" to route national calls through the incumbent operator TELCOM's Network, and other two-digit prefixes to route them through competitive operator's Networks. The main requirements to provide this type of equal access efficiently are:

- A Numbering Plan that allocates available numbers on equitable basis among all NLD Operators including the incumbent.
- Rules requiring incumbent operators to give new entrants access to basic signalling services, including Calling Line Identification (CLI), Databases, answer and disconnect supervision functions.

- Appropriate billing and auditing arrangements, allowing each carrier to bill customers directly or to procure billing services from another carrier or third-party billing agent.

#### **4.1.3 Operator Pre-selection**

a) Under this approach, customers pre-select an operator for some or all of their calls. For example, a customer may select a preferred carrier for all long distance and international calling. Pre-selection allows all such calls to be routed automatically to the chosen carrier. The main requirements for this type of equal access are:

- Switch software features needed to identify each customer's pre-selected carrier and to route and bill all calls accordingly.
- Appropriate billing and audit arrangements to permit direct billing by each pre-selected carrier or consolidated billing by a single carrier (usually the local access provider, which may bill the end user and then remit payments for long distance calls to the pre-selected long distanced carrier).

b) The implementation of equal access has been uneven around the world. It is available in many countries – including Argentina, Australia, Canada, Chile, Germany, Hong Kong SAR, Switzerland and the United States, among others – but it remains unknown in many parts of the globe. Equal access is more common for international services. In some countries, equal access is delayed due to delays in implementing a Numbering Plan that allows equivalent allocation of numbers to competitors.

c) A combination of the two methods is also possible.

4.1.4 In the European Union, dynamic carrier selection and pre-selection has been implemented in most of the countries. Annexure H is an extract from a EU document on Carrier Selection options in Europe and some other countries. Annexure I contains a release dated 8<sup>th</sup> January 2001 by OFTEL on finalisation of Carrier Pre-Selection Charges. Annexure J indicates the status of Carrier Selection in the European Union.

## **4.2 Carrier Selection Status in India**

4.2.1 Given below is an extract from NLD Licence Agreement on Equal Ease of Access.

Clause 17.1 It shall be mandatory for fixed service providers, cellular mobile service providers, cable service providers, to provide Interconnection to NLD service providers whereby the subscribers could have a free choice to make inter-circle/ international long distance calls through NLD service provider.

#### 4.2.2 The new Basic Service Licence Agreement has the following main provisions on Equal Ease of Access:

2.2 Licensee shall be free to carry Intra-Circle long distance traffic. However subject to technical feasibility, the subscriber of the Intra-Circle long distance calls, shall be given the choice to use the Network of another Basic Service Provider in the same service area. The Licensee can also make mutual agreements with National Long Distance Operators for carrying intra-Circle Long Distance traffic.

2.4: It shall be mandatory for the LICENSEE to provide Interconnection with National Long Distance (NLD) Service Providers, through suitable mutual arrangements / agreements, whereby the subscribers could have a free choice to make Inter-Circle / International Long Distance Calls through any NLD Service Provider. For international Long Distance Calls, the LICENSEE shall access International Long Distance OPERATOR through National Long Distance Operator only. Similarly, inter-circle leased lines are to be provided by suitable mutual agreements / arrangements with NLD Service Providers.

16.1: The Licensee shall ensure adherence to the National Fundamental Plan (describing Numbering and Routing Plan as well as Transmission Plan) issued by Department of Telecom and technical standards as prescribed by the Licensor or TRAI from time to time. In the case of providing choice of Long Distance Operator, the equipment shall support the selection facilities such as dynamic selection or pre-selection as per prevailing regulation, direction, order or determination issued by Licensor or TRAI on the subject.

17.3: Licensee shall Interconnect with National Long Distance (NLD) Service Providers through suitable arrangements/ Agreements whereby the subscribers could have a free choice to make Inter-circle/ International Long Distance calls through any NLD Service Provider. For international long distance call, the Licensee shall access International Long Distance Operator through National Long Distance Operator only. Similarly, inter circle leased lines are to be provided by suitable mutual agreements / arrangements with NLD Service Providers. Licensee can enter into mutual agreement/ arrangement with NLD Service Providers for carriage and delivery of inter-circle traffic for the leg between LDCC and SDCC.

17.4 Licensee shall be free to carry Intra-Circle Long Distance traffic. However, subject to technical feasibility, for these Intra-Circle Long Distance calls, subscriber shall also have the choice to use the Network of the Basic Service Providers in the same service area. The Licensee can enter into mutual agreement with NLDO for carriage of Intra-Circle Long Distance calls.

17.11: The Network resources including the cost of upgrading/ modifying Interconnecting Networks to meet the service requirements of service will be provided by service provider seeking Interconnection. However mutually negotiated sharing arrangements for cost of upgrading/ modifying Interconnecting Networks between the Service Providers shall be permitted.

4.2.3 The issues relating to Carrier Selection were examined by a High Level Technical Committee under the aegis of TRAI as referred earlier in para 1.3 also. This was subsequent to TRAI Recommendations on National Long Distance Services. Based on the same, TRAI issued Recommendations to the Licensor on the Allotment of Codes for introduction of Dynamic Call by Call Selection of NLD Carriers. These are available at Annexure F. Letter to the Licensor for incorporating suitable clauses in the License Agreement of BSOs

to reflect the Recommendations of TRAI on NLD operations relating to Equal Ease of Access was also issued and the same is available as Annexure G.

4.2.4 Extracts from TRAI's Recommendation on Carrier Selection Code are reproduced below:

For Dynamic Call by Call selection, the subscriber should dial the STD prefix i.e. "0" followed by a NLD Service Code (NLDSC, a Carrier Access Code (CAC), and thereafter the National Significant Number (NSN) of the called subscriber. Thus dialling sequence will be : 0 + NLDSC + CAC + NSN.

For example, for dialling Mumbai from Delhi, the subscriber will dial :

'0' + '10' + '55' + 22 + 3451234  
(NLDSC) (CAC) (Area Code) (Local Number)

The Authority recommends adoption of "10" as the NLD Service Code. This code will be required to be dialled for all NLD Calls involving carriage over NLLD Network operators facilities.

In regard to Carrier Access Code, which will identify the NLD Operator chosen by the subscriber, the Authority recommends a two digit Code beginning 40 and ending at 59, thus giving 20 codes to be allotted to all NLD Carriers, including BSNL. The Authority feels that number of NLD operators would be less than '20' for the planning period of five years. The position would be reviewed after that period.

Regarding charging for Interconnection link between NLD Operator's POP at LDCC, and that of the BSO at the SDCC, the charges specified for such links in the Telecommunication Interconnection (Charges and Revenue Sharing) Regulation of May 1999 are applicable. Please note that this Interconnection Regulation also emphasizes mutual negotiations between Interconnection seeker and provider. Further, for estimating cost of origination, termination and transit on the NLD Network, cost of unbundled Network elements are required by the Authority to issue a determination, in case operators do not come to a mutual agreement on the modalities of inter Carrier settlements. The work of Accounting Separation and has just begun, and is likely to take about 6 to 8 months. The operators may be asked to expedite the Accounting Separation in accordance with Authority's recommendations.

4.2.5 TRAI has not yet issued any Recommendations on dialling procedures for ILD Carrier Selection or code allotment, though the High Power Technical Committee had recommended 00+10+XY+ International Significant Number. There is an alternate option to use 00 +91 + XY+ International Significant Number. As recent TRAI Recommendations permit normal Toll Quality and below normal Toll Quality ILD Services, each ILD Operator would need two 'XY' codes if the ILDO deploys two type of ILD Services.

4.2.6 At present, it is not technically feasible to provide a dynamic choice for International calls since the digit storage capacity is inadequate. Service Providers will have to take steps to upgrade their switches to handle 23 digits.

4.2.7 In the Pre-Selection procedure, the subscriber registers in advance, the identity of his preferred National/ International Carrier with his Basic/ Cellular Service provider. When a pre-selection registered subscriber dials '0' or '00',

the specified operator will be automatically selected by the system. This requires identification of the subscriber's class by introducing certain procedures in the exchanges and requires significant Network up-gradation. The local exchange would have to use this information, to determine the outgoing trunk route. It would be possible for the user to override the Pre-Selection process by dialling the Dynamic Selection Code.

4.2.8 TRAI's Recommendation on International Long Distance Services envisages direct routing from an access provider to an ILDO in some cases. This would be possible after a minimum storage capacity of 21 digits is available.

### **4.3 Schedule for Introduction of Pre-Selection**

In the context of NLD competition, a subscriber is likely to find it difficult to change his / her pre-selected choice from the incumbent's (BSNL's) Long Distance Network to another Network, until the alternative NLDO has established a Network that can be reached for most destinations. Dynamic Carrier selection, by which the subscriber selects the NLDO only for selected destinations, may be a more acceptable option at the starting stage of the NLD liberalisation process. By the time NLDOs achieve substantial Roll-out (say 2/3 years), Pre-Selection also will become more practicable option. There would, however, be another major consideration for an early introduction of Pre-Selection, that is the issue of 'Default Carrier' which is discussed in the next Section.

### **4.4. DEFAULT CARRIER**

#### **4.4.1 Background**

If the Carrier Selection Code is not dialled, either the call will not be completed or it will have to be routed to a default Carrier. This is in the interest of the subscriber who should not be forced to dial 4 extra digits on every trunk call. If default Carrier procedure is not followed, users will be forced to dial 14 digits instead of 10 digits on all NLD calls. This may lead to adverse public reaction, increased dialling errors and other problems. **Default Carrier is significant only in the interim phase before Pre-Selection is introduced.** This procedure puts a new NLDO at a disadvantage with respect to the BSNL which functions as both NLDO and Access Provider. This matter requires to be considered and addressed.

#### **4.4.2 TRAI's NLD Recommendation**

4.4.2.1 TRAI NLD Recommendations of 13<sup>th</sup> Dec.1999 on Carrier Selection made following points.

47. Suitable access arrangements shall be made available to NLD service providers by Access Providers. Carrier Access Codes (CAC) should be notified having



dialing parity with Access Providers in conformity with the National Numbering Plan. It should be used to identify a long distance carrier by a customer of any AP in order to promote free choice and equal ease of access (EEA).

48. The technical arrangements for choosing an NLD service provider by dialing a CAC or pre-selection shall be made by all Access Providers (AP). Such arrangements should be made by APs in consultation with NLD service provider before commissioning NLD service and should form part of an Interconnect agreement. In case the facility of carrier pre-selection needs extended time, the APs must ensure its provision preferably within a **period of three years**.

49. It would be desirable that a technical group consisting of representatives of DOT, DTS and other APs, under the aegis of TRAI, is assigned the task of devising a scheme for dialing- access to different NLDOs and APs. The objective should be to formulate a suitable scheme of access codes of uniform number of digits for the NLD service providers and APs with adequate provision for additional players at a later date. The group may also supervise arrangements for introduction of pre-selection and for an inter-carrier charge billing system.

#### **4.4.2.2 In response to DOT's reference for reconsideration, Revised TRAI Recommendation on the subject is as follows :**

47 All NLD/ AP operators including DTS will be allotted a carrier access code (CAC) in the interest of dialling parity as already recommended. In case of default i.e. absence of CAC, in the digits dialled by the subscriber, the call should be routed to a recorded announcement requesting the subscriber to prefix his destination code with the CAC of the chosen operator. In due course pre-selection will be introduced to achieve equal ease of access as already recommended.

### **4.5 Considerations**

a) The available options for selection of the default Carrier is to specify it by policy or allow it to be selected at the discretion of the BSO. The BSO may also choose to distribute such traffic amongst available NLDOs. No changes are required in the current Network in case the option of default Carrier Selection is left to the discretion of the Access Provider. If the Carrier Selection Code is not dialled, feeding a recorded announcement asking the subscriber to consult the directory or a special service operator to find out the 'CAC' of a NLD of his choice, is technically feasible. However, this could cause some annoyance to the customers and also increase the total processing time for such calls, with some adverse affect throughput of the switches.

b) Access Providers (BSOs/ CMSOs) have in their interaction with High Level Technical Committee strongly recommended that the system of default carrier be introduced. Because if no default mode is prescribed, the average number of digits dialled would increase, and the requirement of providing announcements for incomplete dialled calls could lead to avoidable congestion in their Network in the initial stages of the introduction of the NLD competition.

c) NLDOs have expressed a contrary view. According to them, compulsory dialling of the CAC is an important aspect of the 'Level Playing Field' and they would be handicapped in their effort to collect traffic particularly in the period

before Pre-Selection is available. One possible solution could be to ask the Access Providers (APs) including BSNL/ MTNL to pass an agreed share of default traffic to the NLDOs who have established Points of Presence (PoPs) in the area of operation of concerned Access Providers (APs) until the Pre-selection procedure is established and subscriber's choices ascertained.

## **4.6 UPGRADATION COSTS**

### **4.6.1 Dynamic (Call by call) Selection**

a) The existing BSNL switches have the capacity for handling the extra digits for selection of National Carriers, but not for International calls. In principle, the additional capacity for analysis exists in most exchanges, but in a few of the older exchanges, modifications or replacements may be necessary. NLDOs and the Access providers will have to co-ordinate their programmes and changes may have to be carried out over a year or so in a phased manner. CMSP operators have generally indicated that their systems already provide for such selection procedures.

b) The traffic related up-gradations, require a much more detailed analysis on the part of all operators and a clearer picture will emerge on the basis of the inputs provided by the operators, much of which is not yet available. Additional Network Costs may be involved in one or more of the following cases:

- i) Software upgrades to accommodate the Carrier Selection Code
- ii) Changes in software, and in some cases in hardware of local exchanges, for extra analysis and processing
- iii) Increase in storage capacity for International Carrier Selection

c) The costs of I) & ii) above are not likely to be very high and Call by Call selection by dialling Carrier Access Code (CAC), can be introduced at an early date i.e., as soon as NLD Operators commission their Networks.

### **4.6.2 Preselection**

a) In the UK, the costs for introduction of Pre-Selection appears to have been distributed between the subscribers and operators. If the subscriber has to pay additional costs to register his pre-selected choice, he may be reluctant and the NLDOs, who do not have any captive subscriber base, may end up having to pay the charges on the subscriber's behalf. Another way of addressing this issue may be to obtain mandatory payment from all subscribers for implementation of the overall pre-selection regime, in the form of small additional payments in their bills. This seems feasible but could prove to be unpopular.

b) In India the principle is that the operator seeking changes should pay for them, however, the methodology for estimating costs, collection and distribution of funds may be complex. There is a strong need to collectively work out the principles relating to verification of costs and sharing amongst various operators. Without a mutually agreed sharing regime system, changes may not be affected smoothly and in time.

#### **4.6.3 General Issues regarding Network Up-gradation Costs**

a) The question of compensation to be provided by Operators who seek up-gradations in the Network of other Operator needs careful consideration. Up-gradations in the Operator's Network may be of two types:

- ❖ Those that are required to be made to meet National Standards, for example QOS.
- ❖ Those that are required to meet the Service needs of other operators

b) It could safely be assumed that the first type of up-gradation i.e. to meet the QOS norms, should be met by each Operator for his Network.

c) It is likely that the second type of improvement may not be carried out until the operator, who has to upgrade, has received payment. This may delay matters unless principles for such payments are agreed to in advance.

d) In this connection two major issues will arise. How should costs be estimated, and how should funds be collected and distributed for implementing the changes.

e) For estimating costs of up-gradation, a statutory mechanism may be necessary since operators have been reluctant to provide any information to the High Level Committee. It may be necessary for the Licensor to mandate these up-gradations subject to a post facto settlement of dues. Also, since the up-gradations can be phased over a period, it is necessary to have a coordinated approach on this issue between APs and NLDOs. This could perhaps be initiated through the High Level Committee (HLC). Once the cost per line of up-gradation are determined, the requesting operators should start making payments based on the areas covered in their roll-out plan.

f) Where an up-gradation would benefit a number of operators, the collection of funds will have to be distributed amongst them. However, when new operators join they may have to reimburse their share to the existing operators.

g) Another practical alternative would be to create a fund, possibly out of the Licence fees recovered from the Access Providers and NLDOs and to advance amounts out of this fund to the incumbent in whose Network most of the up-gradations may have to be done. The amount may be recovered from the concerned Operators, through the license payment regime as a temporary

surcharge and credited back to the fund. A rolling fund like that could take care of the funding problems relating to the up-gradation of the incumbent's Network and could avoid quite a few roadblocks to the growth of a satisfactory Interconnection regime.

**4.7 Questions :** In the light of the above discussion, the following issues need to be discussed with the stakeholders:

4a) What should be a reasonable time frame to introduce Carrier Pre-selection, after the NLD Service is started based on Carrier Access Code (CAC) as already recommended by TRAI?

4b) Introduction of Pre-Selection and increase of storage capacity to 23 digits, may involve significant up-gradation costs. These costs are future costs. What should be the mechanism for determination of these costs? Who should bear the cost of up-gradation of the incumbent's Network to introduce pre-selection?

4c) In case NLDOs are to bear the costs, how to apportion share of the cost recovered between various Access Providers?

4d) In an open competition scenario, when a new operator comes in at a later date, to what extent should he contribute towards meeting the costs incurred in the past?

4e) Pre-selection would involve additional storage capacity and other hardware and software-upgrades. What would be the best way to coordinate the efforts / actions of the different BSOs and NLDOs towards technical/ Network up-gradation or modification to facilitate Carrier Selection? Can an industry level agreement to which all operators will subscribe, achieve this objective? Such an arrangement will also be an important step towards industry self-regulation.

4f) What would be a techno-economically feasible and an acceptable Carrier Pre-Selection Procedure for International Long Distance Calls and Intra-Circle Long Distance Calls?

4g) What would be a reasonable time frame for introduction of Carrier Pre-selection facilities in respect of International calls?

4h) In the interim period before Pre-Selection is made available, all calls where no Carrier Access Code is dialled, the following options would be available:

- Routing call to an announcement machine so that the caller dials again.
- Routing automatically to Default Carrier as selected by BSO.

- Specifying a Routing policy so that Default traffic is distributed amongst the NLDOs in an agreed proportion.

Which of the above or any other option would you recommend and why?

4i) In case calls are routed through a default Carrier, those operators who own both Access and National Long Distance Networks will have an advantage over those NLDOs who have no direct access to subscribers. How can this issue be addressed for maintaining a level playing field?

## **5. ISSUES RELATING TO AN INTERCONNECT BILLING SYSTEM**

### **5.1 BACKGROUND**

The Interconnect Agreement between the Department of Telecom (now BSNL) and six Basic Service Operators to whom licenses were issued in the second half of 1997, at Chapter VII gives the details of an Interconnect Billing System. The latest License Agreement issued to the new Basic Service Operators also provides for Interconnect Billing so that proper Inter-carrier settlements and reconciliation take place in respect of Carriage Charges.

### **5.2 Outline of an Interconnect Billing System**

The existing digital Switching Systems are designed to generate only detailed charging information for billing the subscribers for calls made by them. Subscriber charging is based on an analysis of the destination code. Detailed information for billing the subscribers like Calling Number, Called Number, Duration of the call etc are generated in a local exchange. In a single operator environment, there was no need to provide for Bulk Billing at the Points of Interconnections for Inter-carrier settlements based on actual usage of each other's Network resources. In a multi-operator environment, there is need for a different kind of Billing System to be connected to Gateway Transit exchanges for settlement of Carriage Charges. Such Interconnect Billing Systems also called Inter-carrier Charge Billing Systems in some countries, are based on Call Data Records (CDRs) generated by Gateway Transit or Trunk Automatic Exchanges (TAX). An Interconnect Billing System is connected to the TAX or Tandem Switches by data communication links. The latter generates Call Data Records which is inputted to the Billing Systems in real time for each call transited through the Transit Network indicating typically the following information:

- a) Carrier Related Information
  - i) Identity of Originating Carrier
  - ii) Identity of Terminating Carrier
  - iii) Identity of Transit Carrier.
  
- b) Geographical Information
  - i) Originating Charging Area
  - ii) Terminating Charging Area
  - iii) Charging areas of POIs located at Entry and Exit of the Transit Network.

Based on the above information, the Interconnect Billing System generates a bill for the Network resources used in transiting the call from Point X to Point Y (Ref Fig. 3.1). Interconnect Billing System determines the Cost of Carriage of the call from Point of Entry to Point of Exit in a Network cloud using a distance element based Cost Matrix, which is part of the Billing Software. The Billing Process essentially characterizes the calls in types such as Short

Haul, Medium Haul and Long Haul, to account for the differences in the Transmission length as well Switching stages.

### **5.3 Need to upgrade the existing Signalling System**

It will be seen from the pre-paras that one of the essential requirements to implement a sophisticated Inter-carriage Charge Billing System (also called Interconnect Billing System) is to generate Call Data Records in the Transit Switches (TAX) to capture various types of Carrier related information, as well as information relating to the Originating, Terminating and Transit Point Charging Areas. Such information flows is only possible if CCS7 Signalling System is available end to end. The existing CCS7 Signalling System i.e. ISDN User Part specified by TEC for the country, does not have provision for conveying these Charging information from one Network to another. Therefore, the National Specifications for CCS7 Signalling will also need modifications. The Switching Software in the existing TAX as well as local exchange will also need modifications. These may involve considerable expenditure in terms of monetary resources as well as time.

### **5.4 Whether the existing System can be adapted for Multi-operator environment**

Considering the Techno-economic problems of implementing the state of the art Inter-carrier Charge Billing System outlined above, it is worthwhile examining whether the existing System between Access Providers and BSNL which is based on Bulk meters provided on incoming junctions could be adapted for the Multi-operator environment involving more than two Operators. These Bulk meters are incremented by the periodic pulse received from down the stream Gateway TAXs. The Gateway TAXs generate pulses at the rates applicable for the distance from the POI to the Destination. The existing System although easier to be implemented, may cause problems relating to reconciliation of the Carriage Charge in case the two Gateway Switches of the two Networks are separated by a distance slab . It does not bill for the distance carriage on a pure Transit Network such as that of a NLD.

### **5.5 Questions**

In the light of the above discussions, the following issues need to be discussed with the stakeholders:

5a) What type of Inter-Carrier Charge Billing System should be adopted for proper settlement and reconciliation between two operators? Whether the Inter-Carrier Charge Billing should be based on the concept of call by call detailed records or on Bulk basis as at present?

5b) In case the first option is chosen, what modifications would be necessary in the Signalling procedure to introduce new messages and new parameters in

the National CCS7 Specification, to accommodate the capability of Charging for Inter-Operator Billing in Multi-Operator Scenario?

5c) How the technical / Network up-gradation or modifications to facilitate Inter Carrier Billing System for Multi-Operator Scenario could be coordinated? How should the cost of such up-gradations in the incumbent's Network be met?

5d) For capturing varying distance elements on the Transit cloud, sophisticated Signalling and Charging Systems may have to be employed. This may involve up-gradation of existing Switching elements in the incumbent's Network. What would be the most appropriate and acceptable method to meet the cost of such up-gradation?



## ANNEXURE A

### CONTENTS OF A TYPICAL INTERCONNECTION AGREEMENT

Contents	Detail and Comments
Interpretation	
Recitals	'Whereas' clauses add historical and legal context to assist understanding by future readers of agreements.
Definitions of key terms	Terminology varies significantly among different countries and operators. It is important to ensure compatibility of terminology with the local environment when adapting Interconnection agreements from other countries. Definitions in other documents may be referenced, e.g. definitions in law or regulations, regulatory guidelines, ITU definitions
Scope of Interconnection	
Description of scope and purpose of Interconnection	Different types of Interconnection agreements have different purposes; (e.g. between local Networks, local to long distance/ international, fixed to mobile, mobile to mobile, local ISP to ISP backbone). The purpose of some Interconnection agreements is to provide termination services or transit services; other involve provision of unbundled <i>facilities</i> , etc. Interconnection architecture (annotated diagrams).
Points of Interconnection and Interconnection Facilities	
Points of Interconnection (POI) and related facility specifications	POI locations (e.g exchanges, meet points) usually listed in an appendix; may be modified from time to time; typically includes exchange types and street addresses. Specific POI facility locations (e.g. digital distribution frame; manhole splice box). Description of Network facilities to be Interconnected (e.g. large-capacity fibre optic terminals with Interconnecting single-mode optical fibres). Specify capacity and/or traffic volume requirements. Indicate which party is to provide which facilities (include diagram of POIs and Interconnected facilities). Technical specifications, for example: Calling Line Identification (CLI) specifications. Other advanced digital feature specifications, e.g. call forwarding, caller name ID, etc. Basic and ISDN call control interface specifications. Local number portability (LNP) query-response Network specifications.
Signalling Interconnection	Specify type of signaling Networks/standards (e.g. CCS7). Signalling POI locations to be specified (i.e. Signal Transfer Points or STPs). Point codes to be specified. Technical interface specifications (e.g. signaling links to be dedicated E-1 or DS-1 transmission facilities; operating at 56 kbps). Diagram of signaling Interconnection architecture.
Network and Facility Changes	
Planning and forecasts	Requirement for mutual notification of Network changes and capacity forecasts, for example: traffic forecasts for each POI;

	<p>local number and portability requirements;  area code saturation and changes to increased digit phone numbers;  default and redundant routing arrangements;  Periodic Network planning reports may be specified.</p>
Facility ordering procedures	<p>Specify rights and obligations of each party with respect to ordering and provisioning of Interconnection facilities (including unbundled Network elements – see below).  Confidentiality requirements and procedures.  Ensure no anti-competitive use of order information (e.g. no contacts with end users; competitive service divisions of operator receiving orders).  Specify point of contact (e.g. Interconnection Service Groups; E-mail addresses, etc.).  Specify order format and procedures (e.g. standard order forms may be utilized in paper or electronic (EDI) format).  Procedures to expedite specific orders.  Co-ordination process for migration of customers between operators (e.g. coordination of cutovers to prevent or minimize service interruptions to end-users).  Procedures for ordering operator to arrange for all equipment installations and changes at end user premises.  Order confirmation and order rejection procedures; timely notification, notification of additional charges, etc.  Order completion notification and reporting requirements.</p>
<b>Traffic Measurement and Routing</b>	
Traffic measurement responsibilities and procedures	<p>Describe party responsible; measurement and reporting procedures (see billing procedures (below)).  Rules for routing of different types of traffic, if any; e.g. local traffic that is to be terminated reciprocally without charge may be carried on “bill-and keep” trunks; traffic for which termination charges apply may be carried on other trunks (e.g. transit trunks, national traffic trunks, etc.).</p>
<b>Infrastructure Sharing and Collocation</b>	
Sharing of infrastructure, procedures and costs.	<p>Availability of poles, conduits, towers, right of way, etc.  Procedures, if any, for determining available capacity;  procedures for allocating capacity among requesting operators (e.g. first come/ first served).  Prices and/or costing method.  Provision and pricing of supplementary services (electrical power, security systems, maintenance and repairs, etc.).  Sub-licences on property of third parties (e.g. right of way owners, municipal and other public and private property owners, where infrastructure is located), insurance and indemnification for damages.</p>
Collocation	<p>Availability of poles, actual or virtual collocation (e.g. for transmission facilities on exchange premises); list of addresses where collocation is available; procedures for determining available space; reservation of expansion space.  Prices and/or costing method for collocated space.  Provision and pricing of supplementary services (e.g. electrical power and emergency backup power, lighting, heating and air conditioning, security and alarm systems, maintenance and janitorial services, etc.).  Procedures for ensuring access to and security of collocated facilities (notification; supervised repair and provisioning work and/or separated premises, etc.).</p>

	Negotiation of other lease and/or licence arrangements, including issues of sub-licences on property of third parties (e.g. building owners, right of way owners, municipal and other public property owners), insurance and indemnification for damages.
<b>Billing</b>	
Scope of billing arrangements and responsibilities	May include different arrangements, for example: Operators billing each other for Interconnection services (e.g. termination) and facilities (e.g. unbundled loops and other Network elements). Performance of billing functions by some operators for others (e.g. local operators billing end-users for long distance or international operators., ISPs, etc.).
Billing procedures	Interconnection billing media – discs, tapes, paper and/or electronic (EDI) transfers; format and software specifications. Guidelines for production of Interconnection billing outputs, including: Applicable industry standards or systems for metering and billing. Billing data format and data elements. Standardized codes and phrases. Billing schedules. Customer Service Record (CSR) provision, including: Details to be supplied by provisioning local operator (e.g. record of Interconnection elements used, including circuit and other (e.g. DSLAM) equipment identification numbers). Media (e.g. tape, paper, etc.) and schedule for delivery. Other requirements to facilitate efficient verification and billing of end-user by non-provisioning operator. Retention periods for billing data.
Payment terms and conditions	Billing fees and related charges. Payment terms and conditions (including late payment penalties, service disruption credits, etc.).
Billing disputes and reconciliation procedures	Contact details for reconciliation and billing queries. Responsibilities to provide any back-up records. Notification of billing disputes. Initial resolution procedures (e.g. escalation to more senior management). Final resolution (referral to arbitration, regulator or courts).
<b>Quality of Service/Performance and Trouble Reports</b>	
Quality of Service	Service performance standards may be specified in appendix, for example: Average time for provisioning Interconnection circuits. Percentage of Interconnection cut-overs made on scheduled dates. Switching and transmission quality measures on Interconnected circuits (e.g. probability of blockage at peak hours, transmission delay and loss).
Testing and Maintenance	Right to make reasonable tests, and to schedule service interruptions; procedures to minimize disruption.
Trouble Reports	Procedure for trouble reports; notice periods; response time standards. Duty to investigate own Network before reporting faults to Interconnecting operator. Responsibility for costs incurred to second operator in investigating faults subsequently found to exist in first operator's Network. Calculation of charges (labour, etc.) for

	investigating trouble reports.
System protection and safety measures.	Responsibilities of parties to take necessary precautions to prevent interference with or interruptions of other party's Networks or customers.
<b>Interchange and Treatment of Information</b>	
Data Interchange Format	Method and format of data interchange between carriers, including data interfaces, software, forms, etc.
Data to be exchanged	Specify all data types and systems for which data is to be interchanged, for example: New facilities and service orders, Network changes and forecasts, billing, etc. Number allocations and other data required for call routing and local number portability (where applicable, e.g. where LNP system is operated by incumbent operator rather than an independent party). Customer listings in directories and databases. Access to other Network databases, for provision of advanced services.
Access to and use of customer information	Confidentiality procedures for customer information, including: Establishment of separate Interconnection services group with secure data (password protection for electronic files; locks for data rooms and filing cabinets, etc.). Confidentiality forms to be completed by all relevant employees (penalties and bonding optional). Procedures to ensure protection of customer privacy.
Access to and use of operator information	Confidentiality procedures (see customer information procedures, above). Intellectual property rights.
<b>Equal Access and Customer Transfer</b>	
Equal access procedures	Procedures depend on equal access approach, e.g. carrier pre-selection, casual selection. Detailed procedures normally incumbent for carrier pre-selection, including: Customer authorization requirements (signature on prescribed form, clear choice requirements). Authentication and measures to prevent unauthorized customer transfers (slamming). Penalties for unauthorized customer transfers. Methods of reporting customer transfers (contact points and data to be provided). Order confirmation procedure (format, medium, etc.). Schedule to implement transfers. Procedures to implement transfers. Dispute resolution process (e.g. escalation through senior management, arbitrator and regulator); information to be provided in dispute resolution process. Procedures for dealing with disputed customers (which operator may contact customer, information to be provided to and/or obtained from disputed customers).
<b>Ancillary Services</b>	
Operator-assistance	Types of operator assistance services to be provided, including directory assistance, translation services, fault report routing, etc. Call handling and operations procedures. Fees and billing procedures.
Other Ancillary Services	Subscriber listings in telephone directories. Information and billing inserts. Repair and maintenance services.

	Other services provided by one or other operator to increase mutual operating efficiencies.
Termination	
Grounds for termination and restrictions	Termination may only be permitted subject to certain restrictions (e.g. regulatory approval for termination of Interconnection by incumbent operator). Grounds for termination by incumbent operator may include: regulatory or court orders; bankruptcy, insolvency, receivership, etc.; cessation of business; fewer, if any, termination restrictions in competitive markets, and by non-dominant operators.
Termination procedures	Advance notice requirements. Payment of non-recoverable Interconnection costs incurred by disconnected operator. Computation and payment schedule for disconnection costs. Dealings with end-users, communication restrictions, etc. Disconnection cutover procedures.
Other Provisions	
Force majeure	List of conditions for which non-performance of Interconnection agreement obligations will be excused.
Assignment	Rights of assignment and restrictions on same (e.g. consent or regulatory approval requirements).
Applicable laws	Identifying jurisdiction whose laws will govern the agreement.
Regulatory Approvals	Specify regulatory approvals required for effectiveness and/or renewal, amendment, termination, etc. of agreement.
Breach of Agreement	Remedies and penalties. Liabilities, indemnification and limitation of liabilities.
Legal interpretation	Standard provisions for legal interpretation and enforcement of agreement (e.g. entire agreement clause, effect of unenforceable terms, cumulative rights and remedies, etc.).
Dispute resolution	Procedures for resolution of disputes under agreement that are not specifically dealt with elsewhere; for example: good faith negotiations, time schedule for same, escalation through management levels; referral to regulator, arbitrator or court (e.g. of different types of issues). Selection of and procedures for arbitration
Term	Duration of term. Renewal rights and procedures.
Amendment	Review and re-negotiation procedures. Impact of regulatory changes.

**ANNEXURE 'B'**  
**Interconnection time frames, delays, and penalties in the American region, selected countries.**

Country	Period to reach agreement	Entity in charge of dispute resolution	Penalty for not Interconnecting
Bolivia	3 months from the request for Interconnection	Superintendencia de Telecomunicaciones	Fines from 2.45 million BS (Bolvianos) to 36.75 million Bs, (roughly between 400,000 USD and 6 million USD), the confiscation of equipment and materials, or one year prohibition from providing services.
Dominican Republic	3 months from the request for Interconnection	Instituto Dominicano de Telecomunicaciones	n.a.
El Salvador	n.a.	Superintendencia General de Electricidad y Telecom	Fines from 5,000 to 5000,000 colones (570 USD to 57,000 UKSD), and 500 to 5,000 colones per day if the infraction continues.
Guatemala	40 working days from the request for Interconnection	Superintendencia de Telecomunicaciones	Fines up to 100,000 USD per day
Mexico	2 months from the request for Interconnection	Comision Federal de Telecomunicaciones	Fines and/or revocation of concession.
Peru	2 months from the request for Interconnection	Organismo Supervisor de Inversion Privada en Telecom	Fines established by OSIPTSEL; repeated infractions lead to revocation of licence
United States	135 days from the request for Interconnection	State Commission	Fines from 110,000 USD for a single violation, up to 1 million USD for a continuing violation
Venezuela	2 months from the request for Interconnection	Comision Nacional de Telecomunicaciones	Monetary penalties of various types

Source: ITU- Trends in Telecommunication Reform Interconnection Regulation

## ANNEXURE C

### **Extracts from THE TELECOMMUNICATION INTERCONNECTION (CHARGES AND REVENUE SHARING) REGULATION 1999 (1 of 1999)**

#### **Section III**

#### **3. Interconnection Charges**

- i. Interconnection charges shall be cost based, unless as may be specified otherwise.
- ii. For determining cost based Interconnection charges, the main basis shall be "incremental or additional" costs directly attributable to the provision of Interconnection by the Interconnection provider.
- iii. No service provider shall discriminate between service providers in the matter of levying of charges for Interconnection.

Provided that a different charge may be levied if justified on the basis of a substantial difference in costs incurred for providing that particular Interconnection.

- iv. No service provider shall be charged for any Interconnection facility it does not seek or require.

Provided that if Interconnection facility cannot be provided in the form that is sought or required by the Interconnection seeker, the issue may be decided mutually between the seeker and provider of Interconnection. In case such mutual agreement is not possible, the matter may be reported to the Authority for a decision. The Interconnection provider shall inform the Interconnection seeker within 45 days of the request for Interconnection facilities whether the facilities can be provided in the form sought or required by the Interconnection seeker.

- v. Charges for certain elements of the Network used to provide Interconnection are specified in the Schedules to this Regulation. Interconnection charges in respect of leased circuits and internet port charges shall be the same as the tariffs for these services specified, respectively, in Schedules IV and VI of the Telecommunication Tariff Order 1999.
- vi. Unless specifically so provided, the Authority has forborne with respect to Interconnection charges.
- vii. Where the Authority has, for the time being, forborne from specifying Interconnection charges, Interconnection seekers and providers shall mutually decide on such charges.
- viii. Interconnection charges mutually agreed among Interconnection seeker and provider shall be based on the principles enunciated in this Section.
- ix. Where mutual agreement for Interconnection charge cannot be reached within three months of initiating such a process for charges with respect to which the Authority has forborne, the Authority may intervene to settle the matter *suo moto* or on the application of either party.

#### **Section IV**

#### **4. Revenue Sharing Arrangements**

- i. Any revenue sharing among Interconnection seeker and Interconnection provider shall take place out of the proceeds of the amount payable by the subscriber for obtaining the service which involves the usage of the Network of the Interconnection provider.
- ii. Unless specifically provided in the Schedules to this Regulation, the Authority forebears with respect to revenue sharing arrangements.
- iii. Where the Authority has, for the time being, forborne from specifying revenue sharing arrangements for any telecommunication service or part thereof, service providers shall mutually decide on such arrangements.

Where mutual agreement for revenue sharing cannot be reached within three months of initiating such a process for revenue sharing with respect to which the Authority has forborne, the Authority may intervene to settle the matter *suo moto* or on the application of either party.

For Basic Services:

<b>(3) Local calls</b>	Bill and keep for each service provider.
<b>(4) Domestic long distance calls (STD calls)</b>	The originating/transit service provider to pay Rs. 0.48 per unit of measured call for traffic delivered from its Network to the Network of the transit/terminating service provider for the call units measured at the point of Interconnection for its further carriage from the point of Interconnection to destination, based on the STD pulse rate.  Provided no such charge shall be payable if the point of Interconnection is at the destination Short Distance Charging Area (SDCA) and also provided that no such charge will be payable if the terminating service provider requests that the call be handed over by the originating/transit service provider at an SDCA other than the destination SDCA.
<b>(5) International calls</b>	The originating service provider to pay Rs. 0.66 per unit measured call to the transit service provider (at present the Department of Telecommunications), for the call units to be measured at the point of Interconnection.

For Cellular Mobile:

<b>(3) Local calls from cellular mobile to basic service subscriber</b>	Payment to basic service provider at the rate of Rs. 1.20 per metered call, with number of metered calls measured at the pulse rate applicable to a basic service local call.
<b>(4) Domestic Long distance calls from cellular mobile to basic service subscriber</b>	Payment to basic service provider at a rate applicable to domestic long distance calls. The charge shall be Rs. 1.20 per metered call, with the number of metered calls measured at the pulse rate applicable to basic service long distance calls, with the chargeable distance equal to the distance of the call carried by the basic service provider for an equivalent STD from point of Interconnection to destination.
<b>(5) International calls from cellular mobile</b>	Payment to basic service provider at a rate applicable to international calls. The charge shall be Rs. 1.20 per metered call, with the number of metered calls measured at the point of Interconnection at a pulse rate applicable to an equivalent international call made by a basic service subscriber.



Explanatory Memorandum:

6. The Authority is preparing a consultation paper on access/carriage charge regime. Access/carriage charges will provide for an efficient Interconnection regime in a situation with multiple service providers Interconnecting with each other, i.e. the telecom environment envisaged in the National Telecom Policy 1999.

7. Work is also underway in the Authority for preparing a consultation paper on accounting separation for telecommunication service providers. Implementation of accounting separation is very important for determining cost based Interconnection charges and revenue sharing arrangements, but this is a time consuming process. The Authority's consultation paper on access/carriage charges will take into account certain aspects of accounting separation in order to determine an access/carriage charge regime in the near future. Any further refinements will be made, if required, when the accounting separation exercise provides more detailed information.

8. The payment by any service provider for connection and use of the Network of another service provider is conceptually divided as under:

- **set-up costs**, i.e. all costs required for initially linking up two Networks and making that link operational (including inputs such as fibre links, ports, building space and any up-gradation of equipment, as well as software required to make the Interconnection operational).
- **Interconnection charges** are the (recurring) amounts payable for the set-up costs;
- **usage charges** are payments for use of the Network for transmission of telecommunications messages by the subscriber of the Interconnection seeker. The mode of payment of such charges includes, *inter alia*, revenue sharing arrangements

In the second consultation paper, the nature of the change in the prevailing system of revenue sharing for basic telecom was summarized as follows:

*"In view of the fact that proposed prices for various services are in the form of price caps, revenue shares are suggested, inter alia, for basic telecom operators. This alters the present system of revenue sharing. For example, in the basic services sector where the current condition requires a payment of specific amounts per pulse (Rs. 0.50 for long distance, and Rs. 0.70 for international), revenue shares of 60:40 and 45:55, respectively, for long distance and international call revenue are proposed for new entrant and DOT [for a call originating from the Network of the new entrant and carried by DOT]." (Chapter I, page xiii)*

The second consultation paper had proposed no revenue sharing for the terminating service provider because of the technical difficulty in implementing the proposed arrangement, and the premise that there would likely be similar number of calls originating and terminating for each new service provider.

To begin with, it must be re-iterated that the revenue sharing arrangements specified in this Regulation are interim, and are not based on detailed cost analysis. Application of an access/carriage charge regime will provide more logically tenable usage charges. That requires a detailed assessment of the underlying costs. It would, moreover, imply major changes to the existing revenue sharing arrangements, and hence an analysis is required also of the revenue implications for service providers. This is so also for suggestions made by ABTO regarding revenue sharing principles. Till any access/carriage charge regime is implemented, a system of revenue sharing must be in place to give effect to the commercial relationships arising through Interconnection.

## **E. CERTAIN OTHER FEATURES**

1. The Regulation includes, similar to the Telecommunication Tariff Order 1999, a reporting requirement and the possibility for the Authority to review and alter any Interconnection charge or revenue sharing arrangement, whether specified by the Authority or those agreed mutually among Interconnection seeker and provider.
2. Similarly, as with the Telecommunication Tariff Order 1999, the Regulation states that in matters addressed by it, the Regulation's provisions over-ride those of the license or Interconnection charges and revenue sharing arrangements specified by originating, transit or terminating service providers.
3. As mentioned above, the Regulation addresses on Interconnection charges and revenue sharing arrangements with regard to Interconnection. Other rules and regulations pertaining to Interconnection have either been specified elsewhere by the Authority, or will be addressed by other Regulations/Orders of the Authority. These include aspects such as agreement on points of Interconnection, technical feasibility of providing Interconnection, and the quality of Interconnection services.

## Annexure D

### PROVISIONS RELATING TO INTERCONNECTION IN

- (i) LICENSE AGREEMENTS OF BASIC SERVICE, CMTS & NATIONAL LONG DISTANCE SERVICE;
- (ii) INTERCONNECTION AGREEMENTS BETWEEN BSNL & BSOs;
- (iii) TRAI DETERMINATION ON POINTS OF INTERCONNECTION BETWEEN CMTS OPERATORS AND BSOs

#### i a) Old Basic Service License Agreement:

4: Unless otherwise mentioned or appearing from context, all the schedules annexed hereto including the tender document with clarifications thereto and the *Interconnect Agreement (omitted in the License Agreement for new licenses)*, entered into between the two operators i.e. Government of India and the Licensee, with subsequent amendments made thereto will form part and parcel of this agreement. Provided, however, in case of conflict or variance on an issue relating to this agreement, the terms set out in the main body of this agreement read with all the Schedules annexed hereto shall prevail.

12: The Licensor reserves the right to, in case of a default of any of the terms and conditions stipulated in the License Agreement or the Interconnect Agreement, impose any penalty as it may deem fit under the provisions of these agreements.

#### Part-B

1.7.3.1: The Licensee may develop its own independent Network, with its own transmission links within each Circle in its service area. However, National/Inter-Circle links would be provided exclusively by DOT, through its long distance Network.

1.7.3.2: The Licensee's Network can have Interconnectivity with DOT's Network at the equivalent level at a local/ tandem exchange and at the LDCC TAX.

1.7.3.3: The Licensee shall be responsible for providing the required transmission links from/to his Network to/from DOT's Network interface points at local/tandem and TAX levels, during the currency of Licence.

1.7.3.4: Interconnectivity between Licensee's Network as specified in the licence and the Network of any other Licensee of Service shall be only through DOT's Network. The Licensee shall not, directly or otherwise, extend any type of service to DOT subscribers through the DELs provided by DOT.

1.7.3.5: Interconnectivity between Licensee's Network as specified in the licence and the overseas communication Network operated by VSNL shall only be through the TAXs of DOT.

1.7.3.6: All planning activities of the Licensee for providing Intra Circle connectivity will be coordinated with the planning activities of DOT. Any circuits leased by the Licensee from DOT shall not be resold as leased circuits to a third party.

1.7.3.7: Demands of either party, i.e., DOT and the Licensee, on the other for the following shall be firmed up at least 12 months (provided that this time frame shall be six months for demand

made for the first occasion in the first year of Licence Period) before the date on which the required connectivity or circuits is/are required:

- number of ports (2048 kbps digital trunks) and type of signaling in the telephone exchanges, location-wise.
- Addition to traffic capacity of exchanges in Erlangs and call handling capacity in BHCA.
- Number of exchanges and signaling capacity to be connected over CCS 7 signalling.
- Number of 2048 kbps circuits or higher order circuits over transmission facilities.
- Analogue connectivity and ports required in exceptional cases.

1.7.3.9: If any change in DOT's/Licensee's Network/ system is introduced to comply with international and national standards or for any other reason mutually agreed to, costs associated with such changes that either party has to make in its Network/ system to maintain the SERVICE and to maintain inter-connectivity with other's Network, shall be borne by the respective parties.

1.7.3.10: Normally, the altering party shall notify in writing atleast 12 months in advance setting out details of the nature, effect, technical details and potential impact on the other party's system of such alteration. A notice period shorter than 12 months can be considered in exceptional circumstances by mutual agreement.

Either party requiring enhancement of features in switching and transmission systems to meet new or unforeseen situations and demands, shall notify the other party at least 12 months in advance.

1.7.3.11: Irrespective of who owns a transmission system of the link Interconnecting one party's exchange to the exchange of the other party, each party will provide accommodation for and operate the terminals of the other party located in its premises. Each party will permit mounting of antennae owned by the other party on its transmission towers subject to feasibility for this purpose. Rental for such lease of space and mounting shall be arrived at on a mutually agreed basis.

1.7.3.15: Licensee shall also comply with the terms and conditions of the Interconnect Agreement along with this licence Agreement.

1.7.6.3: The Licensee may install TAX in the LDCC in which it wants to operate. This could be an Integrated Local cum Tandem exchange. This will be known as Licensee's LD TAX.

1.7.6.4(i): If Licensee has only one exchange in an SDCA, connectivity from that exchange to DOT's Network in the SDCA shall be through a direct link between that exchange and the DOT's local exchange/ SDCC tandem. If Licensee has two or more terminal exchanges in an SDCA, connectivity between Licensee's exchanges in the SDCA and DOT's Network in the SDCA shall be through a link between Licensee's SDCC tandem and DOT's local exchange/ SDCC tandem.

1.7.6.4(ii): In a multi-exchange area such as Metro and Major telephone districts, wherever the originating and terminating traffic to and from an exchange of DOT justifies more than two PCMs, the Licensee shall provide direct junctions for the said exchange.

1.7.6.5: Interconnectivity for STD/ISD calls shall be ordinarily only between DOT's LDCC TAX and Licensee's LDCC TAX. In case Licensee does not have his own TAX in the LDCC, STD/ISD calls from Licensee's SDCC Tandem/ local exchange in an SDCA in the LDCA shall be routed to DOT's LDCC TAX. This requires the Licensee to connect to the nearest DOT TAX even for Intra Circle calls that may be between two LDCCs. However, the Licensee is free to have his Network for carrying the traffic entirely over his own Network within the Circle/ Service Area.

1.7.6.6: Calls from DOT subscriber or DOT Network to Licensee's Network will be routed in the DOT Network upto the farthest point i.e. upto DOT's SDCC Tandem/local exchange in the terminating SDCA and then will be delivered to the Licensee's SDCC Tandem/Terminal exchange. National numbering plan, which is revised periodically from time to time, shall have to be adhered to/complied with.

1.7.6.7: If the Licensee serves multiple SDCs through one large exchange, DOT shall deliver the traffic directly into Licensee's large exchange from its TAX except for local and intra SDCA calls. For calls delivered from DOT's TAX to Licensee's Main exchange, the latter shall be treated as terminal exchange and no access charges shall be payable by the DOT to the Licensee.

The above situation of one main exchange serving multiple SDCs does not exist in DOT at present. However, if a similar situation arises at a later date, the same facility shall be extended to the Licensee as well, provided it is not technically feasible to accept the calls directly by the remote DOT exchange in the SDC.

## **i      b)      New Basic Service License Agreement:**

2.3 Licensee shall be free to carry Intra-Circle long distance traffic. However subject to technical feasibility, the subscriber of the Intra-Circle long distance calls, shall be given the choice to use the Network of another Basic Service Provider in the same service area. The Licensee can also make mutual agreements with National Long Distance Operators for carrying intra-Circle Long Distance traffic.

2.4: It shall be mandatory for the LICENSEE to provide Interconnection with National Long Distance (NLD) Service Providers, through suitable mutual arrangements / agreements, whereby the subscribers could have a free choice to make Inter-Circle / International Long Distance Calls through any NLD Service Provider. For international Long Distance Calls, the LICENSEE shall access International Long Distance OPERATOR through National Long Distance Operator only. Similarly, inter-circle leased lines are to be provided by suitable mutual agreements / arrangements with NLD Service Providers.

2.5: Direct Interconnectivity among all Telecom Service Providers in the licensed SERVICE AREA is permitted. LICENSEE shall Interconnect with Cellular Mobile Telephone SERVICE PROVIDER at the station of Gateway Mobile Switching Centre (GMSC) or Mobile Switching Centre (MSC), unless mutually agreed otherwise, subject to compliance of prevailing regulations, directions or determinations issued by TRAI under TRAI Act, 1997.

9.2: The LICENSEE shall intimate the LICENSOR one month prior to his intention of commencement of service by establishing a POINT OF PRESENCE (POP). However, the exact date of commencement of the service shall be required to be intimated to the LICENSOR within one week from the date of such commencement along with the proof of completion of INTERCONNECTION tests as stipulated in Clause 25 of this AGREEMENT.

16.1: The Licensee shall ensure adherence to the National Fundamental Plan (describing Numbering and Routing Plan as well as Transmission Plan) issued by Department of Telecom and technical standards as prescribed by the Licensor or TRAI from time to time. In the case of providing choice of Long Distance Operator, the equipment shall support the sselection facilities such as dynamic selection or pre-selection as per prevailing regulation, direction, order or determination issued by LICENSOR or TRAI on the subject.

17.1: Direct Interconnectivity among all Telecom SERVICE PROVIDERs in a SERVICE AREA is permitted. Interconnect between the Networks of different SERVICE PROVIDERs shall be

as per national standards of CCS No.7 issued from time to time by Telecom Engineering Centre (TEC). However, if situation so arises, INTERCONNECTION with R2MF signaling may be permitted by LICENSOR upon mutual agreement of LICENSEES.

17.2: The number of points of INTERCONNECTION (POIs) of Cellular Mobile Service Providers with Basic Service Providers shall be as per mutual agreement subject to compliance of prevailing determination, regulation or direction issued by TRAI under the TRAI Act 1997.

17.3: LICENSEE shall Interconnect with National Long Distance (NLD) SERVICE PROVIDERS through suitable arrangements/ Agreements whereby the subscribers could have a free choice to make inter-circle/international long distance calls through any NLD SERVICE PROVIDER. For international long distance call, the LICENSEE shall access International Long Distance Operator through National Long Distance Operator only. Similarly, inter circle leased lines are to be provided by suitable mutual agreements / arrangements with NLD SERVICE PROVIDERS. LICENSEE can enter into mutual agreement/ arrangement with NLD SERVICE PROVIDERS for carriage and delivery of inter-circle traffic for the leg between LDCC and SDCC.

17.4 LICENSEE shall be free to carry intra circle Long Distance traffic. However, subject to technical feasibility, for these intra circle long distance calls, subscriber shall also have the choice to use the Network of the Basic Service Providers in the same service area. The LICENSEE can enter into mutual agreement with NLDO for carriage of intra-circle long distance calls.

17.5: The LICENSEE may enter into suitable arrangements with other service providers to negotiate Interconnection Agreements whereby the Interconnected Networks will provide the following :

- a) To connect, and keep connected, to their applicable systems, To establish and maintain such one or more Points of Interconnect as are reasonably required and are of sufficient capacity and in sufficient numbers to enable transmission and reception of the messages by means of the applicable systems,
- c) To meet all reasonable demand for the transmission and reception of messages between the Interconnected systems.

17.6: The terms and conditions of Interconnection including standard interfaces, points of Interconnection and technical aspects will be as mutually agreed between the service providers subject to compliance of prevailing regulations, directions and determinations issued by TRAI under TRAI Act 1997.

17.7: The LICENSEE shall, for the purpose of providing the SERVICE, install own equipment so as to be compatible with other service/ access providers' equipment to which the LICENSEE 's applicable systems are intended for Interconnection.

17.8: The LICENSEE shall comply with any order, direction, determination or regulation issued by TRAI under TRAI Act, 1997 as amended from time to time.

17.9: The LICENSEE shall operate and maintain the licensed Network conforming to QUALITY OF SERVICE standards to be mutually agreed between the service providers in respect of Network-Network Interface subject to such other directions as LICENSOR or TRAI may give from time to time. Failure on part of LICENSEE or his franchisee to adhere to the QUALITY OF SERVICE stipulations by TRAI and Network to Network interface standards of TEC, shall adversely affect the LICENCE of the LICENSEE.

17.10: The charges for access or Interconnection with other Networks shall be based on mutual Agreements between the service providers subject to compliance of any determination,

orders, directions, restrictions and regulations issued from time to time by TRAI under TRAI Act, 1997.

17.11: The Network resources including the cost of upgrading / modifying Interconnecting Networks to meet the service requirements of service will be provided by service provider seeking Interconnection. However mutually negotiated sharing arrangements for cost of upgrading/ modifying Interconnecting Networks between the service providers shall be permitted.

25: The Interconnection Tests for each and every interface with any service provider may be carried out by mutual arrangement between the LICENSEE and the other party involved. The Interconnection Tests schedule shall be mutually agreed. Adequate time, not less than 30 days, will be given by the LICENSEE for these tests. On successful completion of Interconnection tests or on mutual agreement between service providers for rectification of deficiencies / deviations, if any, the LICENSEE can commence the SERVICE. In case of disagreement for rectification of deficiencies / deviations in conducted Interconnection tests, prior approval of LICENSOR shall be required.

### **i c) CMTS License Agreement:**

4: The resources required for operation of the services, for extending them over the Network of the DOT and MTNL and any other service provider licensed by the Authority will be mutually agreed between the parties and shall be listed. The resources may refer to include but not limited to – physical junctions, PCM derived channels, private wires, leased lines, data circuits, other communication elements. The Licensee shall apply for and obtain from the DOT the determined resources. The operation and charge of the traffic passed through these resources shall be treated on the basis of the prevailing rules and guidelines of the DOT on the subject.

Necessary interface specification and requirements with full details with DOT/MTNL equipment for Interconnecting the Cellular Mobile Telephone Equipment should be furnished within one month from the effective date by the Licensee to the Authority. The Authority will have the right to decide the extent of the equipment required based on genuine needs of the Licensee.

The acceptance testing for every interface with the DOT and MTNL Network shall be carried out by the Acceptance Testing party of the DOT/MTNL. The Acceptance Testing schedule shall be mutually agreed to.

All long distance connectivity outside the service area will be through PSTN Network of DOT.

### **i d) National Long Distance Service License Agreement:**

#### **Schedule-I**

**Definition of Point of Presence (POP):** Setting up of switching center and transmission center of appropriate capacity by NLDO at the LDCC level to provide on demand inter-circle long distance services of prescribed quality and grade of service in a non-discriminatory manner.

16.3 Interconnection between the Networks of different service providers shall be as per national standards of CCS No.7 issued from time to time by Telecom Engineering Center (TEC).

17.1 It shall be mandatory for fixed service providers, cellular mobile service providers, cable service providers, to provide Interconnection to NLD service providers whereby the subscribers

could have a free choice to make inter-circle/international long distance calls through NLD service provider.

17.2 NLDO shall be required to make own suitable arrangements / agreements for leased lines with the Access Providers for last mile

17.3 The NLDO Licensee may enter into suitable arrangements with other service providers to negotiate Interconnection Agreements whereby the Interconnected Networks will provide the following :

- a) To connect, and keep connected, to their Applicable Systems,
- b) To establish and maintain such one or more Points of Interconnect as are reasonably required and are of sufficient capacity and of sufficient numbers to enable transmission and reception of the messages by means of the Applicable Systems,
- c) To meet all reasonable demand for the transmission and reception of messages between the Interconnected systems.

17.4 The terms and conditions of Interconnection including standard interfaces, points of Interconnection and technical aspects will be such as mutually agreed between the service providers.

17.5 The LICENSEE shall for the purpose of providing the SERVICE install own equipment so as to be compatible with other service/ Access providers' equipment to which the LICENSEE's Applicable Systems are intended for Interconnection.

17.6 The LICENSEE shall promptly comply with any order or direction or regulation on Interconnection issued by the TRAI under TRAI Act, 1997.

17.7 The LICENSEE shall operate and maintain the licensed Network conforming to Quality of Service standards to be mutually agreed between the service providers in respect of Network-Network Interface.

17.8 The charges for access or Interconnection with other Networks for origination, termination and carriage of calls shall be based on mutual agreements between the service providers subject to the restrictions issued from time to time by TRAI under TRAI Act, 1997.

17.9 The Network resources including the cost of upgrading / modifying Interconnecting Networks to meet the service requirements of National Long Distance service will be as per mutually negotiated sharing arrangements between the service providers.

25.1 The Interconnection Tests for each and every interface with the DTO / MTNL / VSNL / or any other Service Provider may be carried out by mutual arrangement between the Licensee and the other party involved. The Interconnection Tests schedule shall be mutually agreed. Adequate time, not less than 30 days, will be given by the Licensee for these tests.

25.2 Service will be commissioned after obtaining clearance from licensor after successful completion of Interconnection tests as mentioned in para 25.1 above.



## **ii) Interconnect Agreement between BSNL & BSOs**

### *(Main Provisions)*

2.1: Interconnectivity to DOT Network:

2.1.1: The Licensee may develop its own independent Network, with its own transmission links within each Circle in its service area. However, National/Inter-Circle links shall be provided exclusively by DOT, through its long distance Network.

2.1.2: The Licensee's Network shall have Interconnectivity with DOT's Network at the equivalent level at a local/ tandem exchange and at the LDCC TAX.

2.1.3: The Licensee shall be responsible for providing the required transmission links from/to his Network to/from DOT's Network at interface points under Clause 2.1.2, at local/ tandem and TAX levels, initially as well as for augmentation from time to time.

2.1.4: Interconnectivity between Licensee's Network as specified in the licence and the Network of any other Licensee of Service shall be only through DOT's Network. The Licensee shall not, directly or otherwise, extend any type of service to DOT subscribers through the DELs provided by DOT.

2.1.5: Interconnectivity between Licensee's Network as specified in the licence and the overseas communication Network operated by VSNL, shall only be through the TAXs of DOT.

2.1.6: The Basic Service Operator will not be permitted to route the traffic originated from GSM Network for inter-circle and international calls, which shall be routed through DOT Network. As regards GSM Network originated calls, which are intra-circle in nature, these may be routed by the Basic Service operator through his own Network but for delivery of such GSM originated calls into DOT Network, the Basic Service Operator will provide a separate group of junctions purely for this purpose which would be distinct from the normal junctions on which Basic Service Licensee's Network originated calls are carried. Provided, this facility will not be available in respect of GSM originated calls within the Metro cities as the licence conditions stipulate that calls going out of Metro Cellular Network will necessarily be routed only through DOT Network.

2.1.7: Notwithstanding anything contained in the above stated clause, the terms and conditions provided in the Licence Agreements including any modifications made thereto, for provision of Cellular Mobile Telephone Service as well as for the provision of Basic Telephone Service, shall have overriding effect.

2.1.9: Licensee is not authorized to provide 'Call Back Services' to its subscribers. Any unauthorized provision and use of such services by any person or firm shall be liable to attract penal provisions of Indian Telegraph Act 1885 and the Indian Telegraph Rules made there under.

2.1.10: Any circuit leased by the Licensee from DOT shall not be resold as leased circuit to a third party.

2.1.11: Irrespective of who owns a transmission system of the link Interconnecting one party's exchange to the exchange of the other party, each party subject to availability and feasibility may provide accommodation for the terminals of such equipment of the other party located in its premises. Each party may permit mounting of antennae for Interconnect link owned by the party on its transmission towers subject to feasibility. Rental for use of such space and mounting shall be arrived at on a mutually agreed basis. Arrangements for installation, operation and maintenance of such equipment will be arrived at by mutual agreement at respective locations.

### 2.3.0: Network Interconnectivity:

2.3.1: Interconnectivity between the Licensee's Network and the DOT's Network shall be as in Clause 2.1.2 of this agreement. Interface points referred to in clause 2.1.2 are described below:

-A tandem switch/ group dialing center of DOT at SDCC will be known as DOT SDCC tandem. Corresponding switch of the Licensee will be called Licensee's SDCC tandem, which can be local cum tandem.

-Tax at the LDCC will be known as DOT's LDCC TAX.

-The Licensee may install TAX in the LDCC in which it wants to operate. This may be an Integrated Local cum TAX and will be known as Licensee's LDCC TAX.

2.3.2.1: If Licensee has only one exchange in an SDCA, connectivity from that exchange to DOT's Network in the SDCA shall be through a direct link between that exchange and the DOT's local exchange/ SDCC tandem. If Licensee has two or more terminal exchanges in an SDCA, connectivity between Licensee's exchanges in the SDCA and DOT's Network in the SDCA shall be through a link between Licensee's SDCC tandem and DOT's local exchange/SDCC tandem.

2.3.2.2: In a multi-exchange area such as Metro and Major Telephone Districts, wherever the originating and terminating traffic to and from an exchange of DOT justifies more than 2 PCMs, the Licensee shall provide junctions for the said exchange.

### 2.3.3: Interconnectivity for STD/ ISD Calls:

2.3.3.1: Interconnectivity for STD/ISD calls shall be between DOT's LDCC TAAX and the Licensee's LDCC TAX. In case Licensee does not have his own TAX in the LDCC, STD/ISD calls from Licensee's SDCC Tandem/ local exchange in an SDCA in the LDCA shall be routed to DOT's LDCC TAX.

### 2.3.4: Calls from DOT Network/Subscriber to Licensee's Network:

2.3.4.1: Calls from DOT subscriber or DOT Network to Licensee's Network will be routed in the DOT Network upto the farthest point i.e. upto DOT's SDCC Tandem/ local exchange in the terminating SDCA and then will be delivered to the Licensee's SDCC Tandem/ Terminal exchange.

If the Licensee serves multiple SDCs through one large exchange, DOT shall deliver the traffic directly into Licensee's large exchange from its TAX except for local and intra SDCA calls. For calls delivered from DOT's TAX to Licensee's main exchange, the latter shall be treated as terminal exchange and no access charges shall be payable by DOT to the Licensee.

The above situation of one main exchange serving multiple SDCs does not exist in DOT at present. However, if a similar situation arises at a later date, the same facility shall be extended to the Licensee as well, provided it is not technically feasible to accept the calls directly by the remote DOT exchange in the SDC. The numbering and charging plans shall always be adhered to by both DOT as well as Licensee.

### 3.1: Capacity Ordering:

3.1.1: Demand/Forecasts of either party i.e. DOT and the Licensee, on the other for the following shall be firmed up at least 12 months (provided that this time-frame shall be six

months for demand made for the first occasion in the first year of Licence period) before the date on which the required connectivity or circuits is/are required:

- number of ports (2048 kb/sec digital trunks) and type of signaling in the telephone exchanges, location-wise.
- Addition to the traffic capacity of the exchanges in Erlangs and call handling capacity in BHCA.
- Number of exchanges and signaling capacity to be connected over CCS7 signalling .
- Number of 2048 kb/sec circuits or higher order circuits over transmission facilities.
- Analogue connectivity and ports required in exceptional cases.

The requirements mentioned above shall be furnished in the prescribed proforma.

3.1.3: Licensee is responsible for providing the required transmission links to and from DOT's Network at permitted interface points at local/ tandem and TAX levels initially as well as for augmentation from time to time. However, in case Licensee requests DOT in writing to provide for such links against payment of prescribed charges, to Interconnect Licensee's Network to DOT's Network, then DOT, subject to technical feasibility, may accept such request in normal circumstances.

3.1.4: The party receiving the Interconnect capacity demand shall intimate, within a period of 15 days from the date of receipt of appropriate demand, either the acceptance or otherwise an alternative proposal for meeting this demand. In case an alternative proposal is not made within such 15 days, the Interconnect capacity demand shall be deemed to have been accepted.

3.1.5: In case an alternative proposal as referred to in para 3.1.4 is made, both parties will meet to firm up the mutually agreed proposal within next 15 days.

3.1.6: After the acceptance of Interconnect capacity demand, DOT will issue a bill based on the Interconnect capacity demand, calculated as per clause 6.3.1, within 15 days to the Licensee for the advance charges for the first year's use of connection. The Licensee shall pay such bill within 15 days of its issue date.

3.1.7: The above stated Interconnect capacity demand will be treated as firm demand from the date of receipt of the first year's advance payment of connection charges. The advance payment thus received by the DOT from the Licensee will be adjusted against the first year's (reckoned from date of actual provision of connection to the Licensee) connection charges for the connections, calculated as per para 6.3.1. In subsequent years, the annual connection charges for the link connections will be paid each year in advance by the Licensee.

3.2.1: The time scale for the provision of capacity ready for testing shall be 12 months following the date of receipt of the firm demand. However, in exceptional cases, a longer or a shorter time frame can be mutually agreed.

3.3: Liquidated Damages:

3.3.1: After placement of the firm demand to provide the Interconnect capacity, if the DOT fails (otherwise than through an act of omission of the Licensee) to make available connection on the ready for test date i.e. 12 months (or mutually agreed time frame) from the date of receipt of advance payment as in para 3.1.6 and 3.1.7 above, then the DOT shall pay, on demand, to the Licensee, liquidated damages for such delays calculated as follows:

(i) 0.5% of annual connection charge calculated for each PCM link/port as per clause 6.3.1. (a) & (b)/(c) of chapter 6 for the number of connections not made available on the ready for test date as per the relevant firm demand multiplied by number of days following the ready for test date till the required connections are made available for ready for test.

(ii) For the purpose of calculation of liquidated damages, the said quantum of delay in provision of connections, shall be reckoned from the date of expiry of 12 months period from the date of receipt of advance/firm demand upto the actual date of issue of notification certifying that such capacity is ready for testing.

The maximum number of days for which the liquidated damages are payable is limited to 30 days.

The payment of liquidated damages shall not release the DOT from the obligation to deliver the ordered connections to the Licensee. In exceptional cases where the delay is beyond 30 days, DOT shall be liable to explain the reasons to Licensee and also to indicate the revised ready for test date.

3.3.2: In those cases where Interconnection links are being provided by Licensee and Licensee fails (otherwise than through an act of omission of the DOT) to make available connections on the ready for test date i.e 12 months (or mutually agreed time frame) from the date of advance payment of port charges to DOT, then the Licensee shall pay, on demand, to DOT the liquidated damages for such delays calculated as follows:

0.5% of annual port charges calculated for each port as per Clause 6.3.1. of Chapter 6 for the number of connections not made available on the ready for test date as per relevant firm demand multiplied by the number of days following the ready for test date till the required connections are made available for ready for test.

The maximum number of days for which the liquidated damages are payable is limited to 30 days.

The payment of liquidated damages shall not release the licensee from the obligation to deliver the requisite connections/links.

#### 3.4: Cancellation of Firm Demand:

3.4.1: The Licensee may cancel a firm demand made for Interconnections required by him at any time prior to ready for test date, by written notice to DOT. In the event of cancellation of an order for Interconnection more than 30 days after its placement, the Licensee shall pay cancellation charges to the DOT.

The amount deposited by the Licensee in accordance with paragraph 3.1.6 above for provision of connections for the relevant capacity firm demand shall be refunded to the Licensee after deducting appropriate cancellation charges.

#### 3.5: Removal and Cessation of Interconnect Capacity:

3.5.1: Subject to the provision of licensing conditions, either party may place a written order on the other for the removal and cessation of Interconnect capacity.

3.5.2: If Licensee requires the removal of, in part or in full, Interconnect capacity already provided under this agreement then an order (in short "removal order" shall be placed on the DOT to that effect. DOT will in turn verify the requirement and remove the capacity within 30 days (or mutually agreed time from) from the date of receipt of the removal order.

If DOT after receiving the request disagrees with the proposed removal, then the capacity will not be removed until joint agreement is reached in accordance with the dispute resolution procedure.

3.5.3: A removal certificate will be issued by DOT to the Licensee for the removed capacity within one month of the completion of the removal work.

3.5.4: The cost of removal of such capacity, thus agreed upon, as payable by the Licensee to DOT shall be the one year's connection charge as defined in Clause 6.3.1. (B) & (c) in respect of such capacity. In case of links provided on Rent & Guarantee basis, the prevalent terms and conditions of DOT for Rent & Guarantee cases, will apply.

3.5.5: Where DOT suggests removal of some Interconnect capacity e.g. due to underutilization of already provided Interconnect capacity etc., the similar procedure as laid down in clause 3.5.1 to 3.5.3 above shall be followed. No removal charge shall be payable by DOT in such cases. However, suitable adjustment for the connection charges already paid shall be made from the date of such removal.

3.6: Traffic Forecast:

3.6.1: The content of the traffic forecast shall be as follows:

traffic from licensee's Network to DOT (For each TAX/SDCC tandem/ local exchange of DOT)

traffic from DOT to Licensee's Network (From each TAX/SDCC tandem/ local exchange of DOT)

3.6.2: Each traffic forecast shall contain

- BHCA of each TAX/SDCC tandem/ local exchange.
- Busy hour Traffic in Erlangs.

3.6.3: Busy hour may vary for various exchanges and it shall be determined from actual traffic figures in the Network.

3.6.4: The traffic figures indicated in the forecast shall be reviewed after the implementation of the Licensee's Network on monthly basis. Both parties shall provide traffic report on all trunk groups used for Interconnection.

3.7: Enhancement of Standards and Features:

3.7.1: If any change in DOT's/Licensee's Network/system is introduced to comply with international standards and national standards or for any other reason mutually agreed to, costs associated with such changes that either party has to make in its Network/system to maintain Interconnectivity with other's Network shall be borne by the respective parties.

3.7.2: Normally the altering party shall notify in writing at least 12 months in advance setting out details of the nature, effect, technical details and potential impact on the other party's system of such alteration. A notice period shorter than 12 months can also be considered in exceptional circumstances by mutual agreement.

3.7.3: Either party requiring enhancement of features in switching and transmission systems to meet new or unforeseen situations and demands shall notify the other party at least 12 months in advance.

Fault Identification and Reporting:

5.1.(i) Each party shall be responsible for running its own system and ensuring the safety of such system.

5.1(ii): Fault reporting mechanism for Interconnect operational problems will be initially worked out jointly by both the parties and this mechanism shall be upgraded from time to time.

6.1 Interconnectivity to DOT Network:

6.1.1: Provision of links to Interconnect Licensee's Network with DOT's Network will be the responsibility of the Licensee as provided under Clause 2.1.2 and 2.1.3.

6.1.2: DOT may, subject to availability, lease lines to Interconnect Licensee's exchange to DOT's exchange in the SDCA/LDCA on payment of charges prescribed by DOT.

6.1.3: The cost of terminating equipment including measurement devices in the DOT LDCC TAX shall be payable by Licensee.

6.1.4: STD/ISD calls will be always delivered to DOT's LDCC TAX and not at the SDCC as provided under Clause 2.3.3. On answering by the called party, periodic pulses will be sent by the LDCC TAX to the Licensee's exchange on R2 signalling and for CCS7 signalling a Charge Band message will be sent, if required.

6.3: Connection Charges:

6.3.1: DOT may, subject to availability, lease PCM links to Interconnect Licensee's exchange to DOT's exchange either at SDCA level or at LDCA TAX level. In both the cases, the connection charge will consist of the following components:

Annual rent and guarantee for the PCM links between the Licensee's exchange to the nearest DOT exchange building will be calculated as per standard DOT terms. The Licensee will also have the option of having the 'end link' or 'last mile' on R&G systems or on contribution work basis as per the standard DOT terms.

In case, DOT's inter-working exchange (point of Interconnection to Licensee's Network) is located in a building other than the nearest DOT exchange building mentioned in para (a) above, annual inter exchange junction charge shall be levied.

For the initial period of three years, the charges for terminating the Interconnecting PCM links (port charges of DOT) shall be payable after opting by the Licensee for either of the two formulae given hereunder and the choice of the Licensee once made on the first occasion shall be treated as final for the total period and for entire Service Area:

The graded scale given below (excluding cost of infrastructure) of Interconnect port charges applicable separately for each exchange of the Circle/ Service Area for various demand situations:-

Sl.No.	Demand for No. of PCMs given by the Licensee to DOT in each exchange	Annual Interconnect port charge per PCM termination (excluding the cost of infrastructure viz land, building, air-conditioning etc.) (in Rs.)
1	2 PCM	2,16,200
2	4 PCM	1,08,100
3	8 PCM	54,100
4	16 PCM	30,600
5	32 PCM	20,400
6	64 PCM	15,400
7	PCM	12,900

- (i) A fixed amount, irrespective of the number of terminations in each exchange for the Circle/ Service Area, of Rs.54,100/- per PCM termination per annum.

After expiry of the said period of three years, the aforesaid arrangements shall stand terminated where after DOT will provide the facility of Interconnect on payment of the charges based on full cost including the cost of incremental infrastructure like land, building, air-conditioning etc.

Notwithstanding anything contained hereinabove, the directions or decisions on the subject by the Telecom Regulatory Authority of India shall be binding on either party and such decision or direction shall be implemented in good faith by both the parties.

Provided always that for a 64 Kbps Analogue port, the said charges shall be Rs.3,200/- per annum per port.

6.3.2: The rates indicated in Annexure 5 for the aforesaid components are based on present costs and are subject to change in the intervening period till the date on which the Interconnect Agreement comes into effect (Effective date). Once, the Interconnect agreement comes into effect, the rates in respect of the aforesaid components at (b) and (c) as applicable on the effective date may remain fixed for the capacity orders placed within 24 months from the effective date. However, as regards the aforesaid component at (a) above, the rates as per DOT terms prevalent at the time of charging shall be applicable.

6.3.3: Even in cases where the link is provided by the Licensee, port charges as at 6.3.1(c) shall be payable by the Licensee to the DOT.

6.4: Access Charges (*now as per TRAI REGULATIONS*)

### **iii) TRAI Determination on Interconnection between BSNL & CMTS Operators:**

For metro cellular operators who provide service in the metro cities of Delhi, Mumbai, Chennai and Kolkata and its adjoining areas, the lowest level where Interconnection ( at the request of Interconnection seeker) should mandatorily be provided by the BSNL/BSO is up to the level of tandem exchanges, for Cellular Telecom Circle operators covering a large geographical area, it should be with the long distance Network of the circle i.e., at the TAX level. The CMTS providers Network may have Interconnectivity with FSP's Network at the level of a Gateway TAX.

In accordance with the stipulation contained in pre para, the incumbent i.e. BSNL will provide the Interconnection requested by the cellular operator within three months at the TAXs of both the levels i.e., I & II. If the incumbent is unable to provide the sought Interconnection within three months, the matter should be referred to the expert committee working under the aegis of TRAI, which will look into the reasons for the delay and attempt a resolution thereof. This Committee has representatives of ABTO, COAI, BSNL, MTNL and VSNL and is chaired by Secretary, TRAI. The Committee will try to resolve all disputes relating to Interconnection arrangements amongst service providers.

In accordance with the Government guidelines relating to NLD services, the NLD operators will be asked to have matching capability of CCS-7 signalling in their gateway TAXs from day one. The Interconnection arrangement should be in accordance with the National Fundamental Plans relating to switching, routing, traffic, charging etc.

Network Interconnectivity will be provided based on technical feasibility from TAX as well as TANDEM in the city where MSC is located. However, connectivity to TAX will be only for outstation calls and connectivity to TANDEM will be only for local calls. Multiple POIs in a service area will be given subject to technical feasibility and integrity of Network. The connectivity of two Networks shall be at the level of Gateway TAX/ Gateway MSC.



## Annexure E

### PROVISIONS RELATING TO BILLING IN

- i) **LICENSE AGREEMENTS OF BASIC SERVICE, NATIONAL LONG DISTANCE SERVICE, CMTS;**
  - ii) **INTERCONNECTION AGREEMENTS BETWEEN BSNL & BSOs;**
- i a) Old Basic Service License Agreement:**

#### 2.1.4: Telephone billing:

Issue of bills at least once in two months to Licensee's subscribers a) for local, national and international calls (dialled and operator assisted) made by the subscriber and b) for service rentals installation etc.

Provision of itemized billing for all STD/ISD calls made by a subscriber.

1.7.8.1: DOT and the Licensee will collect and retain the billed amount for calls originating from their respective Networks which terminate within the same SDCA or the contiguous telephone exchange of the adjacent SDCA (Group Dialed Calls). No access charges is payable for local call traffic. Access charges are payable by Licensee for STD and ISD calls.

1.7.8.2: The traffic delivered on any DOT LDCC TAX from Licensee's LDCC TAX/SDCC tandem/ local exchange will be measured on the incoming junctions of the DOT's LDCC TAX at the destination wise pulse rates applicable to the calls generated locally at the same station, where the DOT's LDCC TAX is located.

#### 11.9: Message Measurement:

The Licensee shall equip itself with the means to measure the originating traffic in respect of each subscriber. It shall be able to generate the billing information in enough detail, to convince the subscribers satisfactorily. The billing disputes or difference, between the Licensee and its subscribers, unless settled amongst themselves within six months can be subjected to arbitration by the Telecom Authority or its nominee.

#### Condition 6: Issue of Bills to subscribers.

6.1: It shall be the responsibility of the Licensee, to cause regular issue of the bills to its subscribers.

#### 6.2: Billing

The Licensee shall not charge, for Service provided to its subscribers, more than DOT's tariff fixed from time to time. The Licensee may, however, charge lower rate of tariff without prior approval from Licensor, provided such changes are intimated to Licensor prior to their implementation.

6.3: The billing system shall be subject to scrutiny by the Licensor.

6.4: Suitable arrangements shall be provided by the Licensee to enable to the Licensor to monitor the billing software and billing data, of its Network.

6.5: The billing period may be decided by the Licensee, but it should be at least once in two months.

## **i b) New Basic Service License Agreement:**

8.3(b): The LICENSEE shall invariably preserve all billing and all other accounting records (electronic as well as hard copy) for a period of one year from the date of publishing of duly audited & approved Accounts of the company and any dereliction thereof shall be treated as a material breach independent of any other breach, sufficient to give a cause for cancellation of the LICENCE.

19.4 The LICENSEE's contractual obligations towards the CUSTOMER will include terms and conditions under which the SERVICES shall be provided or terminated. The LICENSEE shall notify to customers all the arrangements or everything with respect to billing, repair, fault rectification, compensation or refunds etc. All complaints in this regard will be addressed/handled as per the guidelines, orders or regulations or directives issued by the LICENSOR.

### **20. BILLING**

20.1 The LICENSEE shall offer a regular itemised billing service (for long distance calls) to its customers without demanding any extra charge. In every case the LICENSEE shall be responsible to its customers and shall ensure fulfillment of the obligations in this regard. The LICENSEE shall also maintain necessary records for the billing cycles as specified by the LICENSOR or TRAI from time to time.

20.2. LICENSEE will work out suitable regular Interconnect billing arrangements with other licensed service providers in the respective Interconnect Agreements with them.

20.3 All complaints of customers in this regard will be addressed/ handled as per the guidelines, orders or regulations or directives issued by the LICENSOR or TRAI from time to time.

20.4 Any dispute, with regard to the provision of SERVICE shall be a matter only between the aggrieved party and the LICENSEE, who shall duly notify this to all before providing the SERVICE. And in no case the LICENSOR shall have any liability or responsibility in the matter towards the aggrieved party and shall be kept indemnified from all costs, charges, claims or damages.

## **i c) National Long Distance Service License Agreement:**

8.3 (b): The licensee shall preserve all billing and all other accounting records (electronic as well as hard copy) for a period of three years from the date of publishing of duly audited & approved concerned Accounts of the company and any dereliction thereof shall be treated as a material breach independent of any other breach sufficient to give a cause for cancellation of the licence.

### **20. BILLING**

20.1 The LICENSEE shall offer either itself directly or through access providers itemised billing services to its customer. In every case the LICENSEE shall be responsible to its customers and shall ensure fulfillment of the obligations in this regard. The Licensee shall also maintain necessary records for the billing cycle as specified by the Licensor or TRAI from time to time.

20.2. The Licensee will provide itemised billing to its customer without demanding any extra charge either directly or through Access Provider. A billing handling charge as mutually agreed

with NLDO may be payable to Access Provider, coinciding with the billing schedule of access providers.

20.3 All complaints of customers in this regard will be addressed / handled as per the guidelines, orders or regulations or directives issued by the Licensor or TRAI from time to time.

20.4 Any dispute, with regard to the provision of SERVICE shall be a matter only between the aggrieved party and the LICENSEE, who shall duly notify this to all before providing the SERVICE. And in no case the LICENSOR shall have any liability or responsibility in the matter towards the aggrieved party.

## **i d) CMTS License Agreement:**

Schedule "C" Part-III – Terms & Conditions:

1.6: The Licensee is responsible for the measurement of the messages, in units, in segments of kilobytes or as the case may be and shall keep a record of the same for purposes of billing in so far as his equipment and the Services are concerned. The Licensee shall maintain all commercial records with regard to the communications exchanged on the Network till the Authority clears for destruction. Such records should be archived for atleast one year for scrutiny by the Authority for security reasons.

6.3: The metering being essence of the amount to be charged from the subscriber should be suitably secured so that it is not accessible to all staff members of licensee but only to a specified few and authorized representative of 'Authority'.

6.4: The record of metering shall be maintained on fortnightly basis by the Licensee. The billing schedule may be longer, if required, than that of metering.

Condition 7: Issue of Bills to Subscribers:

7.1: It shall be the responsibility of the Licensee, to cause issue of the bills to his subscribers. The Licensee can issue bills only to the extent of those messages and for the duration, where applicable, carried on the Cellular System at rates prescribed by the Authority.

7.2: The billing shall be subject to audit by the Authority. Billing and/ or collection may be done by EDOT, if so requested, on mutually agreed terms and conditions.

7.3: The operator should provide detailed itemized billing information to those subscribers who may like to have it.

7.4: The billing cycle may not be less that one month or more than three months for any connection provided under this License.

13.1(b): In the interest of security, billing records will be preserved for a period of one year and made available to the Authority or it's representative as and when required.

## **ii) Interconnect Agreement between BSNL & BSOs:**

Chapter 1 – Definitions:

Bill Issue Date means the 10<sup>th</sup> of every calendar month.

Billing Period: The period of one calendar month commencing on the first day of every month.

Billing Information: Information, as in Chapter 6 and 7, necessary to ascertain the charges payable by either party under this agreement.

6.2: Detailed Billing:

6.2.1: For every STD/ISD call originating from the Licensee's Network and accepted by DOT, a detailed billing and/or bulk billing record will be generated in the LDCC TAX. For this purpose calling subscriber's identity shall be supplied by the Licensee for detailed billing purpose.

6.4.2: DOT and the Licensee will collect and retain the billed amount for calls originating from their respective Networks which terminate within the same SDCA or the contiguous telephone exchange of the adjacent SDCA (Group Dialed Calls).

6.4.4: For STD calls, originating in the Licensee's Network and accepted by DOT (ref. Para 6.2.1), DOT will bill the Licensee on monthly basis as STD -access charge at a rate of Rs.0.50 per unit measured call at the point of Interconnection.

6.4.5: For international calls originating in the Licensee's Network and accepted by DOT (ref. Para 6.2.1), DOT will bill the Licensee on monthly basis as ISD Access charge at a rate of Rs.0.70 per unit measured call at the point of Interconnection. The responsibility of paying to the international carrier (presently Videsh Sanchar Nigam Limited) will lie with the DOT.

6.6.2: Licensee will be billed by DOT on monthly basis for trunk call charges and phonogram charges at the prevalent notified DOT tariffs.

6.6.3: Duration of the call will be counted from the time when the Licensee's operator is informed by the DOT Trunk operator that:

in the case of particular person call, the specified person is one the line.

In the case of call other than a particular person call, the called number or called extension, when the call is booked to an extension is connected.

Chapter 7 – Interconnect Billing System:

7.1: Bill Information:

7.1.1: Each party shall provide to the other party information relating to detailed billing/ trunk group bulk billing as may be reasonably required for ascertaining the charges payable by each party under this agreement on monthly basis.

7.1.2: The DOT or the Licensee shall have the right in case of dispute, having given the other not less than ten clear and working days advance written notice to such effect, to inspect the books and records of the other relating to a period not exceeding two years prior to the date of inspection, for the purpose of verifying the Billing information provided by the other in respect of such period.

7.1.3: Each Party shall keep all books and records relating to Billing Information provided by it to the other, in respect of access charges (clause 6.4) and charges for special services (clause 6.6), for a period of two years from the end of the Billing Period in respect of which such Billing Information was delivered to the other. If a request has been made as per provisions in 7.1.2 such records will have to be preserved till final settlement of the case.

7.1.4: In the event that any time during the continuance of this Agreement the Billing System of either Party malfunctions and is unable to provide all or part of the Billing Information necessary for such Party to prepare a bill to the other, the other Party shall at the request and expense of the first mentioned Party use its reasonable endeavours to supply the necessary

Billing Information to the first mentioned Party without any legal liability to the first mentioned party for the contents of such Billing Information.

7.1.5: Licensee shall be responsible to cover its liability for payment of taxes imposed by the Central or State Government, as the case may be.

7.2: Issue of Bills:

7.2.1: Bills for access charges and charges for special services including trunk calls will be issued on monthly basis by the designated unit of DOT to the Licensee and such bills shall be payable within 15 days from the date of issue. Similar bills may also be issued by the Licensee for the access charges, if any, due to it.

7.2.2: Bills for telecom resources and other support facilities, such as connection charges, charges for leased facilities and charges for enhancement of features, if availed by the Licensee will be issued by DOT and paid by the Licensee at the intervals specified in this agreement.

7.3: terms of payment:

7.3.1: DOT and the Licensee agree that the payment of bills will be made by the Licensee within the time specified in clause 7.2 above.

The mode of payment will be through cheque/Demand draft in favour of the designated authority of DOT, drawn at the local branch of any scheduled bank at the place where such designated authority of DOT is located.

All payments due to DOT will be paid without set off (netting) or counter claim and shall be free and clear of any withholding or deductions.

If the bill issuing authority subsequently finds that some charges have been omitted from the bills issued, he will include the omitted charges in the subsequent bills at any time, but within 6 months from the date of issue of the relevant bill except in cases where additional billing becomes necessary due to the tariffs/rates changes notified subsequently with retrospective effect by the appropriate authority.

7.3.2(i): If due payment is not received within specified period outlined in the bill, the DOT shall have a right to obtain payment through the use of Letter of Credit which shall be opened by the Licensee in favour of DOT as provided herein below after the concurrence of Licensee's first and single failure of making said payments in specified time.

7.3.2(ii): The opening of the aforesaid Letter of Credit in favour of DOT or use thereof to receive payments shall not detract in any manner the DOT from discontinuing the use of its facilities by the Licensee after failure in making due payment. Provided, before disconnecting the said facilities, 30 day's notice shall be given to the Licensee but such notice will be construed to have any link or connection with the use of Letter of Credit.

7.4: Opening of Letter of Credit:

7.4.1: The Licensee, immediately on the occurrence of first and singular failure in making due payment of DOT's bills, shall open an irrevocable and confirmed Letter of Credit in favour of DOT at the point of access in a scheduled bank with one year period of validity extendable from time to time such that the extension shall be requested for a period of one year from the last default, if the default occurred during the validity period of the Letter of Credit for an amount equal to 10% of the access charges and trunk call charges in respect of each Service Area, payable/paid by the Licensee to the DOT during the preceding 12 calendar months.

7.5: In the event of delayed payment by the Licensee, interest will be charged on the due amount at the following rates:

	Period Delay	Interest Rate
A.	For the first two occasions of delay: (i) Delay of 15 days beyond the due date	18%
	(ii) Delay beyond 15 days but up to the next 15 days	21%
B.	For the third & subsequent occasions of delayed payment: (i) Delay of 15 days beyond the due date	21%*
	(ii) Delay beyond 15 days but up to next 15 days	24%*

\*Note: This stipulated interest rate or the prevailing prime lending rate of State Bank of India plus 5% (five percent) per annum (compounded monthly), which ever is higher, shall be applicable.

Explanation: The interest referred above will also be applicable in case the bill is disputed but subsequently it is found to be in order by the appropriate authority.

7.6: Settlement of Disputes regarding wrong/excess Billing:

7.6.1: In the event the Licensee disputes the accuracy of a bill delivered by the DOT pursuant to this Agreement it will, as soon as practicable, but in any case before the pay-by-date notify the billing liaison contact of the DOT of the nature and extent of the dispute along with all details reasonably necessary to substantiate its claim, which shall be reasonably capable of being verified by the DOT.

7.6.2: In case of calculation or clerical error in the bill, the bill issuing authority after verifying the bill, if it finds the error genuine, will correct the relevant bill accordingly within three days of the receipt of the complaint.

7.6.3: In cases other than those referred in clause 7.6.2, the Licensee shall immediately obtain a provisional bill from DOT before the pay by date of the original bill on the basis of the number of call units of the previous month. The provisional bill shall be paid by the Licensee before the pay by date indicated in the provisional bill. Thereafter, within 7 days of the issue of the provisional bill, the Licensee shall approach the designated authority of DOT along with all his relevant records based on which the Licensee disputes the bill issued by DOT. The Licensee shall, in consultation with the designated authority of DOT, settle the dispute within 15 days of the issue of the provisional bill referred in this clause. In this consultation, the records made by the measurement devices located at the DOT interface point shall have precedence over the records of the Licensee. If after consultation, it is found that the bill issued by DOT is correct, the balance amount of the bill, which was kept under dispute (after the issue of the provisional bill), will also have to be paid by the Licensee within 7 days of the settlement of such dispute.

7.6.4: After the settlement of the dispute, if balance of the due payment is not made within the period referred to in clause 7.6.3., the DOT shall discontinue the use of its facilities by the Licensee immediately on occurrence of this default. Restoration of the facility will be made only on clearance of the due payments by the Licensee. The Licensee shall also take action to open irrevocable Letter of Credit in favour of DOT as per clause 7.4.1 of the Inter Connect Agreement in the event of such a default.

7.6.5(i): Notwithstanding provided herein above, if the dispute over the accuracy of the bill fails to be resolved, in the manner already provided, one party, after calling upon the other so to

agree, refer the dispute to the Telecom Authority, as an expert and not as an arbitrator, for resolution of the dispute. The decision of the Telecom Authority shall be final and binding.

7.6.5(ii): The cost of reference to Telecom Authority as an expert shall be borne equally by the parties unless such expert shall decide that one party has acted unreasonably in which case, he may have discretion as to awarding of costs.

7.6.5(iii): This clause may not be construed to preclude the right of a party under the Telecom Regulatory Authority Ordinance 1996 or any other law in force to seek TRAI's involvement in the resolution of a dispute where such involvement is within TRAI's functions and powers under the said Ordinance.

7.6.5(iv): Each party shall continue to fulfill its obligations under the Interconnect Agreement during the pendency of dispute and which dispute resolution process invoked under sub para (i) above.

7.6.5(v): Any party shall not use any information obtained from other party during the course of dispute resolution process under this clause for any purpose other than to resolve the dispute and such information shall not be in a litigation before Civil Court.

**ANNEXURE F**  
Telecom Regulatory Authority of India

No.404-1/2000-FN

Dated the 19<sup>th</sup> June 2001

To

The Dy. Director General (Basic Services),  
Department of Telecommunications,  
Sanchar Bhawan,  
New Delhi

Sub: Allotment of Codes to NLD Operators, for introduction of Dynamic Call by Call Selection of NLD Carriers by subscribers

Ref: DOT letter No. 10-5/99-BS.I/Vol.II dated 24<sup>th</sup> Aug 2000

Dear Sir,

Kindly refer to your letter on the above subject. A high level Committee was set up by the TRAI to examine all the relevant issues relating to the implementation of NLD guidelines referred to in your letter. The Committee has representatives of DOT, BSNL, MTNL, ABTO, COAI, C-DOT, TEC and is chaired by Secretary, TRAI. The subject matter has been deliberated at length in the committee and in its Working Group. Based on the inputs provided by the Committee, the Authority would like to recommend as follows:

For Dynamic Call by Call selection, the subscriber should dial the STD prefix i.e. "0" followed by a NLD Service Code (NLDSC)/a Carrier Access Code (CAC), and thereafter the National Significant Number (NSN) of the called subscriber. Thus dialing sequence will be : 0 + NLDSC + CAC + NSN.

For example, for dialing Mumbai from Delhi, the subscriber will dial :

'0' + '10' + '55' + 22 + 3451234  
(NLDSC) (CAC) (Area Code) (Local Number)

b) The Authority recommends adoption of "10" as the NLD Service Code. This code will be required to be dialed for all NLD Calls involving carriage over NLLD Network operators facilities.

c) In regard to Carrier Access Code, which will identify the NLD Operator chosen by the subscriber, the Authority recommends a two digit Code beginning 40 and ending at 59, thus giving 20 codes to be allotted to all NLD Carriers, including BSNL. The Authority feels that number of NLD operators would be less than '20' for the planning period of five years. The position would be reviewed after that period.

2. Regarding charging for Interconnection link between NLD Operator's POP at LDCC, and that of the BSO at the SDCC, the charges specified for such links in the Telecommunication Interconnection (Charges and Revenue Sharing) Regulation of May 1999 are applicable. Please note that this Interconnection Regulation also emphasizes mutual negotiations between Interconnection seeker and provider. Further, for estimating cost of origination, termination and transit on the NLD Network, cost of unbundled Network elements are required by the Authority to issue a determination, in case operators do not come to a mutual agreement on the modalities of inter Carrier settlements. The work of Accounting Separation and has just begun, and is likely to take about 6 to 8 months. The operators may be asked to expedite the Accounting Separation in accordance with Authority's recommendations.

Yours faithfully,  
(Harsha Vardhana Singh), Secretary



**ANNEXURE G**

**Telecom Regulatory Authority of India  
A-2/14, Safdarjung Enclave,  
New Delhi-110 029**

No. 404-1/2000-FN

Dated the 20<sup>th</sup> July 2001

To

DDG (Basic Services)  
Department of Telecommunications,  
Sanchar Bhawan,  
New Delhi-110 001.

SUB : Incorporation of suitable clauses in the License Agreement of BSOs to reflect the recommendations of TRAI on NLD operations relating to Equal Ease of Access through Pre-selection.

Ref : DOT's letter No.10-5/99-BS-I/Vol.II dated 24<sup>th</sup> Aug'2000 & TRAI's letter No.404-1/2000-FN dated 19th June, 2001.

Dear Sir,

Your attention is invited to the recommendations (para 48 of the NLD recommendation) of the Authority on the above subject matter. The same is quoted below for ready reference :

*"The technical arrangements for choosing an NLD service provider by dialing a CAC or pre-selection shall be made by all Access Providers (AP). Such arrangements should be made by APs in consultation with NLD service provider before commissioning NLD service and should form part of an Interconnect agreement. In case the facility of Carrier pre-selection needs extended time, the APs must ensure its provision preferably within a period of three years".*

2. A High Level technical committee working under the aegis of TRAI with representations of DOT/ BSOs/ BSNL/ MSOs has finalized Carrier Access Codes for NLD operators, for introduction of Dynamic Call by Call selection immediately after commissioning of NLD Network s. The same was communicated to you vide our letter of even number dated 19<sup>th</sup> June.

3. The Committee has done considerable work regarding the introduction of pre-selection for Equal Ease of Access (EEA), so as to introduce pre-selection at an early date. A tentative time plan has been drawn up by the committee to introduce pre-selection within 2 ½ years of issue of the first licence. A copy of a tentative plan drawn up by the committee for upgradation of switches of the Access Providers and for making other technical arrangements to implement Carrier pre-selection is enclosed.

4. It is requested that suitable clauses may be incorporated in the license agreement of the BSOs/ CMSPs to reflect the Authority's recommendations relating to Equal Ease of Access (EEA), through pre-selection. A copy of the License Agreement after incorporating suitable clauses as suggested, may please be sent to this office for information of the Authority.

Yours faithfully,

(Harsha Vardhana Singh)  
Secretary-cum-Principal Advisor

## TENTATIVE TIME SCHEDULE FOR IMPLEMENTATION OF PRE-SELECTION

Assuming that the first NLD License is issued at time **D**, the following schedule is proposed:

- i. **D+1 months** NLDO supplies the first year roll-out plan to Access Providers within 1 month of issue of the licence.
- ii. **D+1 months** TRAI to lay down principles and procedures of compensation for directly attributable incremental costs of Access Providers for carrier selection.
- iii. **D+6 months** All Access Providers who are ready, to provide Dynamic Carrier Selection to the subscribers requesting for the same in LDCAs covered in the first year's Roll-out Plan.
- iv. **D+6 months** All Access Providers who can provide pre-selection may start to do the same.
- v. **D+9 months** NLDOs to supply Roll-out plans for years 2 and 3 to Access Providers.
- vi. **D+12 months** Access Providers to arrange for introduction of Dynamic Carrier selection in accordance with the roll-out plan provided the NLDO is ready for the same.
- vii. **D+12 months** All Access Providers start action for introduction trials of pre-selection in accordance with an agreed programme.
- viii. **D+21 months** All Access Providers to upgrade switches for handling of 23 digits in support of International Carrier Selection.
- ix. **D+30 months** All Access Providers to complete pre-selection in the network covering all LDCAs covered in the NLDO's request and Roll-out Plan.

## **ANNEXURE H CARRIER SELECTION OPTIONS : EUROPEAN UNION**

One possibility for Carrier selection is through the use of prefixes (short codes) to be dialed in front of the subscriber number in a single stage dialing procedure Identification of the calling party is done through the Calling Line Identification (CLI).

Another possibility is by calling a special service access codes to Carrier services after which the dialed number is entered together with a special code for authentication of the subscriber. This latter possibility is a two stage dialing procedure which is more prone to fraud and resembles calling card services in use today.

The main options for Carrier selection in a single stage dialing procedure are:

A: default Carrier determined by access Network operator (local operator) with possibility of override by user on call by call basis. This options is sometimes referred to as easy access;

B: pre-selection of Carrier by the customer plus possibility of override on call by call basis. There are some variants on this method e.g. change default Carrier through instant DTMF dialing (change pre-selected Carrier on-line) or pre-selected Carrier determined by regulator on the basis of market share. This option is referred to as equal access;

C: the use of Carrier Selection Codes for all calls. Clearly, this option is in contradiction with the Council Decision on the introduction of a standard telephone access code.

The commission believes that the requirement for a harmonized access code should prevail as, with the implementation of Option B, it does not form a barrier to the development of effective competition. Option C is therefore not considered further.

With the implementation of easy access (Option A), operators will not loose market share in long-distance and International traffic as quickly and substantially as with the implementation of equal access (Option B) because they will normally elect to route their long-distance and International traffic via their own channels. Option A could therefore be an intermediate step in a phased approach with Option B as the medium to long-term goal and cause a more gradual transition towards an open competitive market than with the implementation of Option B right from the start.

### ***Cost/benefit of Carrier selection***

Studies carried out for the Commission and ETO concluded that Carrier selection mechanisms are mandatory to foster competition in main telecommunications markets. Users must be able to easily select a Carrier wherever they are in Europe for their National and International long-distance telephony services.

The experience with Carrier selection is strongest in the US where, after the divestiture of AT&T and the introduction of inter-exchange long-distance competition, the long-distance rates have been slashed by approximately 40 %. Another example is Finland. Since the introduction of long-distance competition between Telecom Finland and the long-distance Carrier of the independent local operators in 1993, long distance tariffs fell by more than 50 %. Remarkably, the total revenue did fall but not as substantial because of increased telephone usage.

The total revenues of the telecommunications market in the European Union in 2000 is estimated at 110-120 Billion ECU. Some 50 % of the traffic is business traffic with some 20% International traffic. By introducing Carrier selection throughout the EU, it works out that between 40-50 Billion ECU of revenues is at stake. Extrapolating the effects on long-distance tariffs which were seen in the US and Finland to the European Union, the introduction of Carrier

selection could save the European customer as much as 20-25 Billion ECU per year. Obviously, the reductions of tariffs would change telephone calling patterns and thus offset somewhat the loss of revenues for operators.

The lower prices of telephone traffic would make the diffusion of information cheaper and thus form an immediate stimulus to the European economy. These direct effects are difficult to quantify in financial terms but are believed to be huge. Besides that, the introduction of Carrier selection would assist in the migration of users from one operator to the other. It would make customers more aware of competitive alternatives, customers would not have to invest so much time and money (including any necessary CPE alterations) in changing to a new operator, customers could try out new operators on a call-by-call basis with no long term commitment, and customers would avoid having to dial additional digits in order to access an other operator's Network .

The cost of introducing Carrier selection cover local Network implementation cost for the incumbent operator and any other local operator required to provide equal access; costs for long distance operators, any extra costs of Network capacity or operations that result from increased customer churn; and end user equipment costs.

An analysis of the cost of implementation of equal access to long-distance Carrier was carried out in the UK. The total direct cost to BT over the period 1995-2004 was estimated between 136.6 and 261.2 [sterling]M. This included cost for Network changes, cost for information system changes, and cost for data build maintenance and staff, training and organization. The cost for other operators for the same period was estimated at 68.6 [sterling]M.

Extrapolating this to the European Union market and assuming similar degrees of Network digitisation and efficiency, the introduction of Carrier selection at the European level would cost about 2 Billion ECU over the ten year period considered.

It is obvious from this very rudimentary analysis that the benefits of introducing Carrier selection by far outweigh its costs. Even if the drop in long-distance tariffs would be much less than assumed, benefits of equal access to Carrier will exceed costs.

Pre-selection equal access was introduced in the US and Australia using slightly different methods.

### ***Move to equal access in the US***

Pre-selection was introduced in the US from September 1, 1984 as local exchanges were given equal access capabilities in rolling conversion programmes. To begin with, once an exchange had been converted to equal access, there was no immediate requirement for all customers to be balloted on their preferred long-distance Carrier. By early 1985, it became apparent that only around 30 % of customers connected to equal access exchanges were pre-selecting a long-distance Carrier (either AT&T or one of the other long-distance Carriers) whilst the remaining 70% were staying with AT&T default.

In May 1985 the FCC released an Order specifying a balloting and allocation plan to be used by local exchange Carrier (LECs) on the introduction of equal access into their exchanges and a retroactive balloting process in cases where equal access had already been introduced. This process required a re-ballot of customers who failed to respond to the first ballot, after which customers who did not respond to either ballot had to be assigned a long-distance Carrier in proportion to those who did respond in the first ballot. Under this system, LECs found that between 60 % and 75 % of their customers now pre-selected a long-distance Carrier, whilst the remaining 24 % to 40% were assigned a Carrier. This increase in pre-selection has been argued to have been a major factor behind AT&T's loss of market during the late 1980s. In particular, its share of inter-state switched traffic fell from 82 % in 1985 (when it had already

faced eight years of competition from MCI without equal access), to 63 % in 1991 when equal access had been rolled out to over 90% of access lines in the US.

### ***Move to equal access in Australia***

Australia licensed a second Carrier, Optus, in December 1991. The new Carrier's Network was operational in major cities by November 1992, and was available to 65 % of the population by the end of 1993. Within 18 months of launch it had captured about 15 % of National and International traffic. Originally access to the Optus Network was through a simple dialing code prefix – 1". If this prefix was omitted calls would be routed over the Telstra (incumbent) Network. However, it was always intended to move to an equal access system of pre-selection with call-by-call override.

Pre-selection balloting began in Australia in July 1993, and will continue on a sequential city-by-city basis until 1997. The process takes the form of a first ballot, with the option for Optus to call for a second ballot in cities where the response rate is less than 60 %. Non-respondents remain with the existing Carrier (in contrast to the US system where they were assigned). It is likely that the share of traffic captured by Optus exceeds its share of lines since it will have tended to have captured customers with higher than average calling rates.

On the basis of the experience of the US and Australia, it appears that effective pre-selection would require the balloting of all customers; and an option of a second ballot if response rates are low. There are however other possibilities than ballots to let users make their pre-selection for instance through marketing campaigns. Unlike the ballot, this latter method allows a better control quality and quantity of customers by the new entrant and allows new entrants with less marketing resources to compete fairly.

Source: EU Website

**ANNEXURE I**  
**OFTEL FINALISATION OF CARRIER PRE-SELECTION CHARGES**

**Ref: 03/01**

**Date: 08 January 2001**

Oftel has today set the charges that BT will make to operators for the setting up and running of permanent carrier pre-selection services.

The charges are contained in a Determination published today.

Launched in December, carrier pre-selection allows consumers with a BT line to choose between different telephone companies for different types of call without changing their existing phone line, and without dialling extra numbers.

Consumers have the option to use BT for their telephone line and local calls, a different supplier for national calls and another supplier again for international calls.

Oftel has made the determination because telecoms companies were unable to agree the charges themselves.

David Edmonds, Director General of Telecommunications said today:

"Carrier pre-selection means far greater choice for consumers. They will be able to shop around for the best deal from several different telephone companies, without having to change their phone line or dialling extra digits.

"This determination gives operators certainty about the charges that will apply to carrier pre-selection so that they can continue in confidence with their roll-out of carrier pre-selection services to customers.

"Consumers are already signing up to the service and with at least 15 companies planning to launch services in the coming year, I expect to see many more consumers benefiting from the greater choice and savings that carrier pre-selection can offer."

**Notes to editors**

1. *Determination under Condition 50A of the Licence of British Telecommunications plc relating to 'permanent' carrier pre-selection* is available from Oftel's website at

[www.oftel.gov.uk/publications/carrier/pcps0101.htm](http://www.oftel.gov.uk/publications/carrier/pcps0101.htm). Copies are also available to the media from Oftel's Press Office on 020 7634 8991 and to the public from Oftel's Research and Intelligence Unit on 020 7634 8761.

2. There are several different types and levels of charge in the Determination. Two important examples are:

- The charge to an alternative operator for setting up CPS on a simple residential line will be £4.46
- The once-off charge for an alternative operator wishing to offer CPS is approximately £22,700.

3. The determination has been made following public consultation on a draft determination that was made on 7 December 2000.

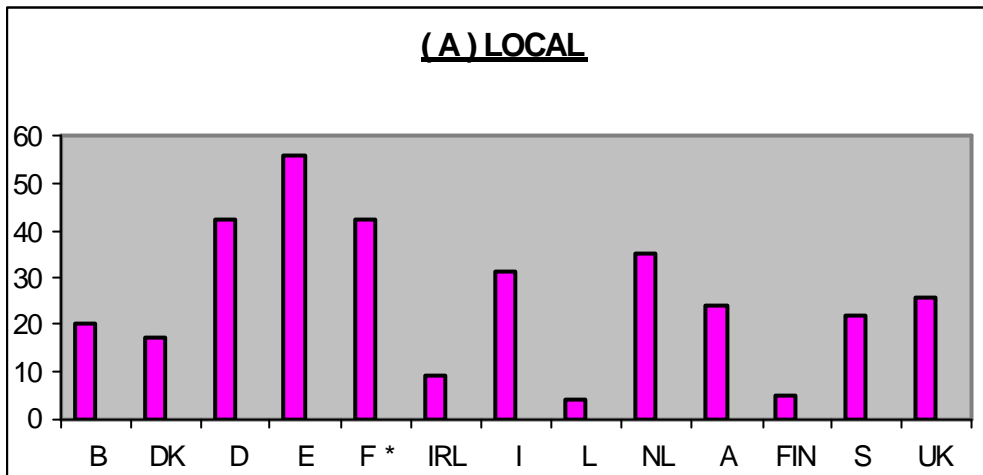
Source: OFTEL

## ANNEXURE J

### CARRIER SELECTION in European Union [Source: EU]

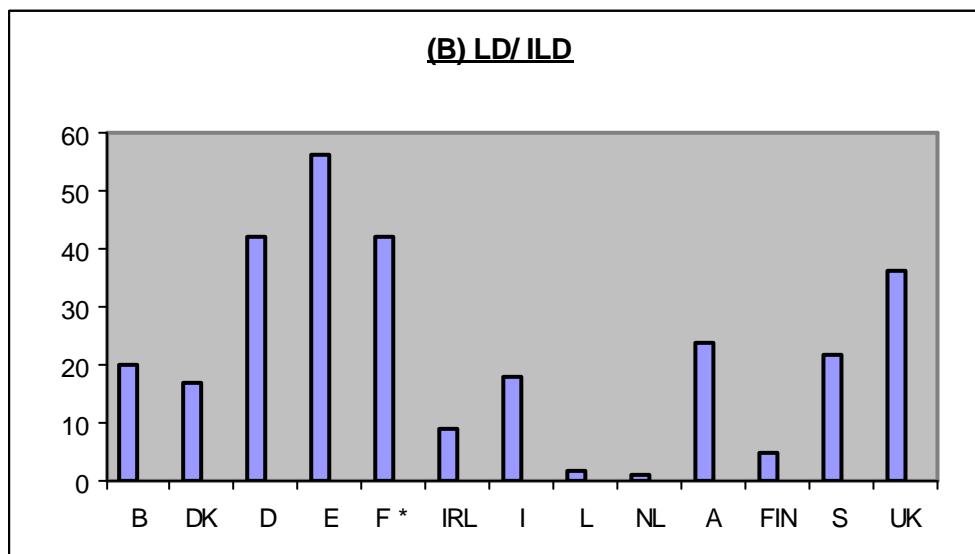
New operators using **Carrier Selection** in European Union for providing fixed voice telephony to residential users for Local, National/ International Long Distance Services is shown in following figures 1 and 2 respectively.

Figure1



Note : Countries are : Belgium (B), Denmark (DK), Germany (D), Spain (E), France(F), Ireland (IRL), Italy (Italy), Luxemburg (L), Netherland (NL), Austria(A), Finland (FIN), England (UK).

Figure 2



New operators using **Carrier Pre-Selection** in European Union for providing fixed voice telephony to residential users for Local, National/ International Long Distance Services is shown in following figures 3 and 4 respectively.

Figure 3

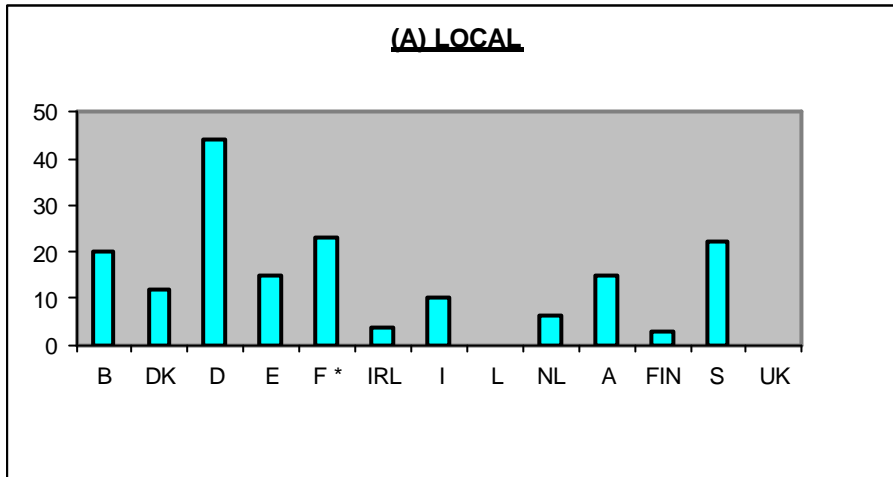
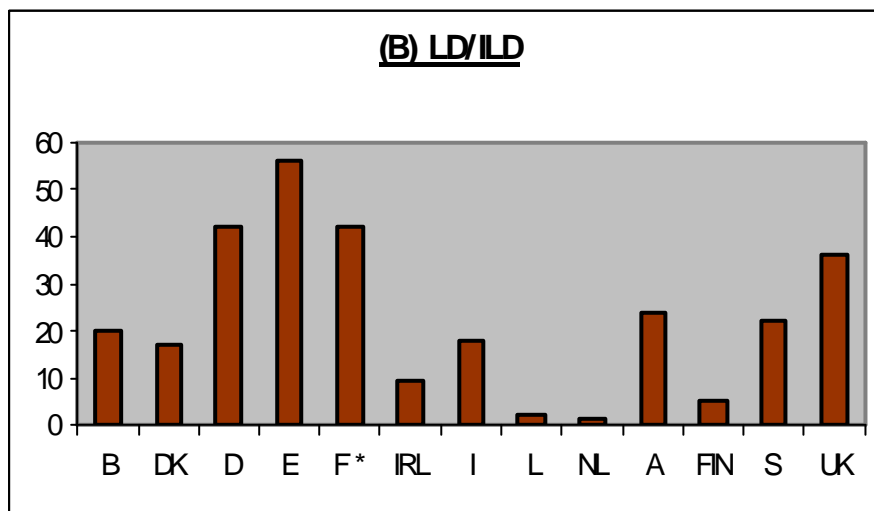


Figure 4





## ANNEXURE K

### INTERCONNECT BILLING IN BT

There are two main billing systems in BT: CSS which is used to provide retail billing for end (retail) customers and INCA which is used to bill for Interconnected calls from other operators. The two systems are completely separate. In general long distance calls are handed over at a BT Tandem switch and can be routed through the BT Network to either the same operator or a second operator i.e. OLOI-BT-OLOI or OLOI-BT-OL02. Interconnected calls handed over at a local switch must terminate on that local switch, BT will not provide long distance conveyance for Interconnected calls handed over at a BT local switch. To provide long distance transit for calls handed over at a local exchange would require additional local to tandem exchange capacity, modifications to local exchange and modifications to the billing systems.

The retail billing system uses only the BT local switches to determine call charges for retail billing. Billing information collected from tandem switches, when collected, is used only for Interconnect billing. Until the need arose to perform Interconnect billing (early 90s) there was generally no need for billing at the tandem switches. The Interconnect billing system has grown substantially and handles more calls than a regional retail billing system. This is a reflection of the number of the number of other operators in the UK market who Interconnect with BT.

The call information recorded at the tandem switch where the calls enters is used in conjunction with an Element Based Cost EBC matrix to compute the cost of the calls. This concept is increasingly being used in Europe. The process essentially characterises the calls as types for example single tandem or double tandem depending on the number of switching stages used. The UK also uses a further splitting of the double tandem in to double tandem long and double tandem short to accommodate the transmission length.

For BT the call charges are regulated and BT is required by OfTel to demonstrate that the charges are cost oriented. As a quick and crude example of how this works, a double tandem call would require the use of two tandem switches and some length of transmission. The total call cost would be calculated by summing the call costs of the components used: switching and transmission. The cost of the transmission would be calculated from the unit cost (p/km/min) of inter-tandem transmission and the average distance a double transit call would be carried. Historical traffic data is used to determine the average distances. Thus the call charges calculated are averaged over the appropriate distance. We can provide more about the method of calculating charges if required.

It is possible that between two points there are many alternative routes. The Network routing system therefore employs a least cost routing algorithm. Essentially the algorithm determines several routes and then looks at the number of switches on each route. The route with the lowest number of switches is selected as the quickest route. The key point is that although the routing of the call through the Network may vary the call charge depends only on the point where the call enters the Network and where it leaves, not the actual route taken.

Source : Inputs received from British Telecomm Regulatory Division in response to a query from TRAI

## ANNEXURE L

**BT format showing the unbundled network elements involved in call conveyance, as well for interconnection of links.**

<b>Statement of costs</b> For the year ended 31 <sup>st</sup> March 1999	Total Operating costs £m	Mean capital employed £m	Applicable rate return of on capital return %	Capital costs £m	Total of operating and capital cost £m	Volume min/unit (b)	Average Cost per min/unit
<b>Network components</b>							
Local exchange concentrator	184	661	12.5	82	266	287,197 mm	<b>0.093p</b>
Local exchange processor	353	1,112	12.5	139	492	280,551 mm	<b>0.176p</b>
Main and digital junction switching	104	255	12.5	32	136	192,421 mm	<b>0.070p</b>
Local to remote transmission link	58	154	12.5	19	77	217,407 mm	<b>0.035p</b>
Local to remote transmission length (c)	74	378	12.5	47	121	343,059 mm	<b>0.035p</b>
Local to tandem transmission link	48	101	12.5	13	61	151,192 mm	<b>0.040p</b>
Local to tandem transmission length (c)	37	203	12.5	25	62	435,459 mm	<b>0.014p</b>
Tandem to tandem transmission link	17	51	12.5	6	23	59,411 mm	<b>0.039p</b>
Tandem to tandem transmission length (c)	28	186	12.5	23	51	824,917 mm	<b>0.006p</b>
Digital derived services network-switch	45	113	12.5	14	59	4,912 mm	<b>1.204p</b>
Digital derived services network-link	5	26	12.5	3	8	4,076 mm	<b>0.197p</b>
Inland directory enquiry	138	40	12.5	5	143	19,997 ms	<b>0.718p</b>
International directory enquiry	15	3	12.5	-	15	936 ms	<b>1.601p</b>
National operator assistance	67	21	12.5	3	70	6,678 ms	<b>1.045p</b>
International operator assistance	12	4	12.5	-	12	1,065 ms	<b>1.159p</b>
Emergency operator assistance (999)	13	2	12.5	-	13	1,306 ms	<b>1.012p</b>
Product management, policy and planning	36	7	12.5	1	37	86,826 mm	<b>0.042p</b>
Numbering information system (DAS)	1	-	12.5	-	1	298 t	<b>£3,464</b>
Public payphone line	12	42	12.5	5	17	140,527 L	<b>£119</b>
Public payphone operations	152	209	12.5	26	178	n/a	(a)
Interconnect connections and rentals	35	81	12.5	10	45	n/a	(a)

Numbering information system (other)	3	1	12.5	-	3	n/a	(a)
Inland private circuits	669	1,999	12.5	250	919	n/a	(a)
BT only other	149	377	12.5	48	197	n/a	(a)
Multifunction platform	59	200	12.5	25	84	n/a	(a)
International network	332	819	12.5	103	435	n/a	(a)
All out-payments	1,970	(511)	12.5	(62)	1,908	n/a	(a)
<b>Total</b>	<b>4,616</b>	<b>6,534</b>		<b>817</b>	<b>5,433</b>		

(a) These components include a number of different elements which are used in different proportions for the delivery of services within this heading. As a result no single volume of usage can be applied and so no unit cost is derived.

(b) mm = million minutes; ms = million seconds; t = terminals; L = lines.

(c) Unit of length is 10 km.

**ADDITIONAL**  
**ANNEXURES**  
**To**

**Consultation Paper 2001/5**

**Issues Relating to Interconnection between**  
**Access Providers and**  
**National Long Distance Operators**

**Dated 14 Dec. 2001**

## **ANNEXURE I**

### **Supplement 1 to Recommendation E.164**

### **ALTERNATIVES FOR CARRIER SELECTION AND NETWORK IDENTIFICATION**

*(Geneva, 1998)*

#### **1 INTRODUCTION**

The changing telecommunications environment has enhanced the importance of being able to choose the Service providers which perform functions on a call. This ability to designate a specific Service provider for a specific portion of a call may be achieved through the use of a prefix, presubscription, signalling, database analysis, or embedding the identification in the number itself. At each hand-off point of a call, the current provider must determine the next provider to which to route the call (provider determination).

#### **2 SCOPE**

This supplement presents a summary of the potential methods for Carrier / Service provider selection and network identification on the public network. The guidance provided may be utilized for both international and national implementations.

This supplement does not specifically address the class of provider determination methods based on contractual agreements, bilateral negotiations, transit routes, or previous traffic (proportional routing). These methods are used by individual providers in determining the next provider to which to route the call.

#### **2 ASSUMPTIONS**

The following is a list of basic assumptions used in generating this supplement.

In considering Carrier Selection and Network Identification techniques methodologies that use information within the signalling should be considered. Information within this supplement is based on current needs and technologies but not at the expense of future needs and technology.

Where a competitive environment is not present, normal call set-up should not be impacted by Carrier Selection techniques.

## 4 REFERENCES

- ITU-T Recommendation E.164 (1997), The international public telecommunication numbering plan.

## 5 DEFINITIONS

The term **carrier selection** is used when the decision is controlled by the **calling party**, and the term **network identification** is used when the decision is controlled by the **called party**. This supplement uses a functional model of network Services to provide a framework for examples of both carrier selection and network identification.

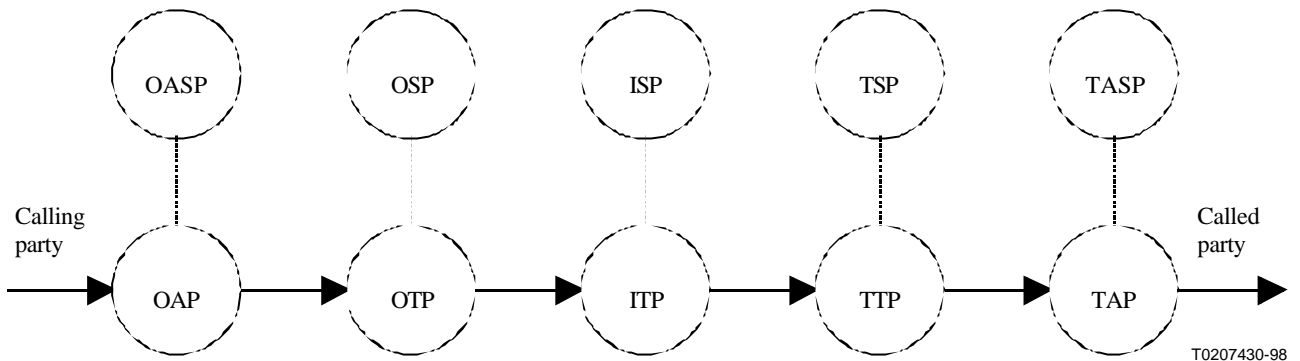
The word "Carrier" in this supplement included both "Access Provider" and "Transport Provider".

## 6 ACRONYMS

This supplement uses the following acronyms.

ISP	Intermediate Service Provider(s)
ITP	Intermediate Transport Provider(s)
OAP	Originating Access Provider(s)
OASP	Originating Access Service Provider(s)
OSP	Originating Service Provider(s)
OTP	Originating Transport Providers(s)
TAP	Terminating Access Provider(s)
TASP	Terminating Access Service Provider(s)
TSP	Terminating Service Provider(s)
TTP	Terminating Transport Provider(s)

## 7 FUNCTIONAL MODELS



**Figure 1 – Functional model**

In discussing issues related to carrier selection/network identification, it is useful to address them in the context of a general model. The model shown (see Figure 1) illustrates the entities and relationships involved in a call. This is a functional model and hence the entities shown are not necessarily distinct companies.

The functions provided in network Service are: connection to/from the network, transport through the network, and Service features. These functions are provided to the calling party (originating) and the called party (terminating). Each provider offering connection or transport may provide Service features or access to an entity providing Service features.

For a call, the calling party connects to the network through the Originating Access Provider (OAP). The OAP determines the Originating Transport Provider (OTP) to carry the call forward via voice path or signalling. The OTP progresses the call to the Terminating Transport Provider (TTP) which could be done via an Intermediate Service Provider (ISP), (e.g. who may provide transit transport Services). The TTP routes the call to the called party through the Terminating Access Provider (TAP). Any one or all of these connection providers could provide access to a Service provider offering features to the calling or called parties.

It is important to re-emphasize that these are functional entities. One carrier could function as multiple entities on a given call. There could be multiple instances of one entity on a given call.

## **8 ALTERNATIVES**

### **8.1 General options for Carrier Selection and Network Identification in relation to E.164 numbers**

For Carriers and Networks, it may be necessary to identify the Carrier/Network which is providing a specific Service. There are three basic methods that can be used to identify Carriers/Networks in relation to E.164 numbers. These options are:

- a) the implementation of Carrier Selection and Network Identification external to the E.164 number;
- b) the implementation of Network Identification internal to the E.164 Number;
- c) the implementation of the complete E.164 Number as a means of identification of the Carrier/Network.

#### **8.1.1 GENERAL CONSIDERATIONS FOR NETWORK IDENTIFICATION IN RELATION TO THE E.164 NUMBER**

The choice of implementation of one of the above methods should be done on the basis of evaluating each individual Service. It will be selected based on Service and operational requirements for each Service application. In some applications, specific recommendations should be made for a preferred method of Carrier Selection and Network Identification using particular numbering resources. In other cases, specific recommendations on the Carrier Selection and Network Identification method should be left as a national matter.

The following is a list of general issues to be evaluated when considering all three Carrier Selection and Network Identification methodologies.

**a) *Timing and equipment availability***

The choice of a particular Carrier Selection and Network Identification approach can be impacted by the time frame (i.e. the requested date) when the Service for which the numbering resources are required. This is because the availability of hardware and software to support the specific Carrier Selection and Network Identification scheme can have an impact on the Carrier Selection and Network Identification method that is selected.

**b) *Impact on network interconnections and interworking***

In choosing a Carrier Selection and Network Identification methodology, the issues of network interconnection and interworking between



networks and carriers should be considered. For example, should a subscriber dial an E.164 number destined to a Carrier or Network other than the network or carrier from which the call originates, then certain inter-working arrangements must be in place for the call to be routed and billed. The apportionment of international traffic between Carriers/Networks may also be impacted once Carrier Selection and Network Identification is associated with an E.164 number.

The transport of Carrier Selection and Network identification information between networks may also be necessary.

**c) *Impact on retaining or discarding Carrier Selection and Network Identification information***

Carrier Selection and Network Identification information is necessary to determine the routing and settlement arrangements for international calls. The nature of a given call type (e.g. calling or called party paid) will determine the need to retain or discard the Carrier Selection and Network Identification information as an international call is routed to its destination address.

**8.1.2 CONSIDERATIONS FOR CARRIER SELECTION/NETWORK IDENTIFICATION OPTIONS**

The following sub-clauses contain specific considerations applying to each of the above three Carrier Selection and Network Identification options.

**8.1.2.1 Considerations for applying the Carrier Selection and Network Identification external to the E.164 number**

It may be possible to use either prefixes or suffixes in dialling E.164 Numbers. The Carrier Selection and Network Identification may also take place in the call related signalling information external to the number. Pre-subscription to a carrier may be one method. Another method may be to allow a subscriber to change their pre-subscription by dialling a short code (on a semi-permanent basis).

Some ramifications of this approach are:

- a) No portion of the numbering space is used for Carrier Selection and Network Identification, and therefore the carrier selection and network identification does not impact the quantity, format or makeup of the numbers.
- b) Additional digits may be dialled (e.g. a prefix or suffix).

- c) All digit combinations (used for the prefix or suffix) are available unless they are already assigned or apportioned for other uses.
- d) Service Provider Portability of Numbers is feasible under this Carrier Selection and Network Identification option.
- e) Modifications to existing signalling protocol may be required to transmit the Carrier Selection and Network Identification identifiers. This may be achieved by using the transit network selection parameter in existing signalling Recommendations.
- f) The calling party must dial the correct information in addition to the E.164 number.

#### **8.1.2.2 Considerations for applying Network Identification internal to the E.164 number**

When identifying the Carrier Selection and Network Identification internal to the E.164 number for particular applications, the following implications should be considered:

- a) **Impact on efficient use of the quantity of available numbers:**

If a portion of the E.164 number is used for Network Identification, then the numbering space is divided into some finite quantity of carrier or network identification groupings. Under each such grouping, a block of numbers is then assigned to individual networks. The efficient use of these E.164 number allocations is dependent on the utilization of the numbers under each network Identification allocation. Should some networks not assign many numbers, the overall efficiency in utilizing these resources may be low. This may lead to premature exhaust of the specific E.164 numbering resource.

- b) **Trade off between Network Identifiers and quantity of subscriber numbers per Network:**

The designation for Network Identification purposes of some quantity of digits in the E.164 number reduces the number of available digits for subscriber numbers and limits the quantity of numbers that any one Network has available for assignment to its particular customer base. The quantity of Network specific numbers is inversely proportional to the number of networks that can be identified within the number.

- c) **Service provider portability is precluded:**

When an E.164 number contains Network specific identification, the flexibility to change Service providers and maintain the same number is lost.

- d) **Routing to the appropriate network is facilitated in an efficient fashion.**

- e) No additional digits are required when an E.164 number is dialled.
- f) From a subscriber's perspective, no additional signalling information is required from the calling user for Network Identification beyond the E.164 number. From a network perspective, no additional signalling information is required for Network Identification beyond the E.164 number if every network node involved in the call correctly interprets the internal E.164 field designated for network identification.
- g) No additional knowledge is required by the calling party beyond the number itself to convey Network Identification information.

### **8.1.2.3 Use of the complete E.164 number as a means to achieve Carrier Selection and Network Identification**

Recommendations E.164 and E.162 require networks to do analysis on seven (7) digits for international calls. Using the complete E.164 number as a means of achieving Carrier Selection and Network Identification requires that the originating network have the ability to analyze the entire Number (up to 15 digits) to determine the particular Carrier Selection and Network Identification. This may require a database lookup capability for E.164 numbers of up to 15 digits in length.

- a) No portion of the numbering space is used for Carrier Selection and Network Identification, and therefore the Carrier Selection and Network Identification does not impact the quantity, format or makeup of the numbers.
- b) All the E.164 numbers can be used and mapped for Carrier Selection and Network Identification unless they are already assigned to some other application.
- c) Service Provider Portability of Numbers is feasible under this Carrier Selection and Network Identification option.
- d) Modifications to existing signalling protocol may be required to transmit the Carrier Selection and Network Identification information.
- e) Routing to the appropriate carrier/network may need database lookup.
- f) No additional digits are required when an E.164 number is dialled.
- g) No additional knowledge is required by the calling party beyond the number itself to obtain Carrier Selection or Network Identification information.

## **8.2 Selection by calling party**

### **8.2.1 FUNCTIONAL DESCRIPTION**

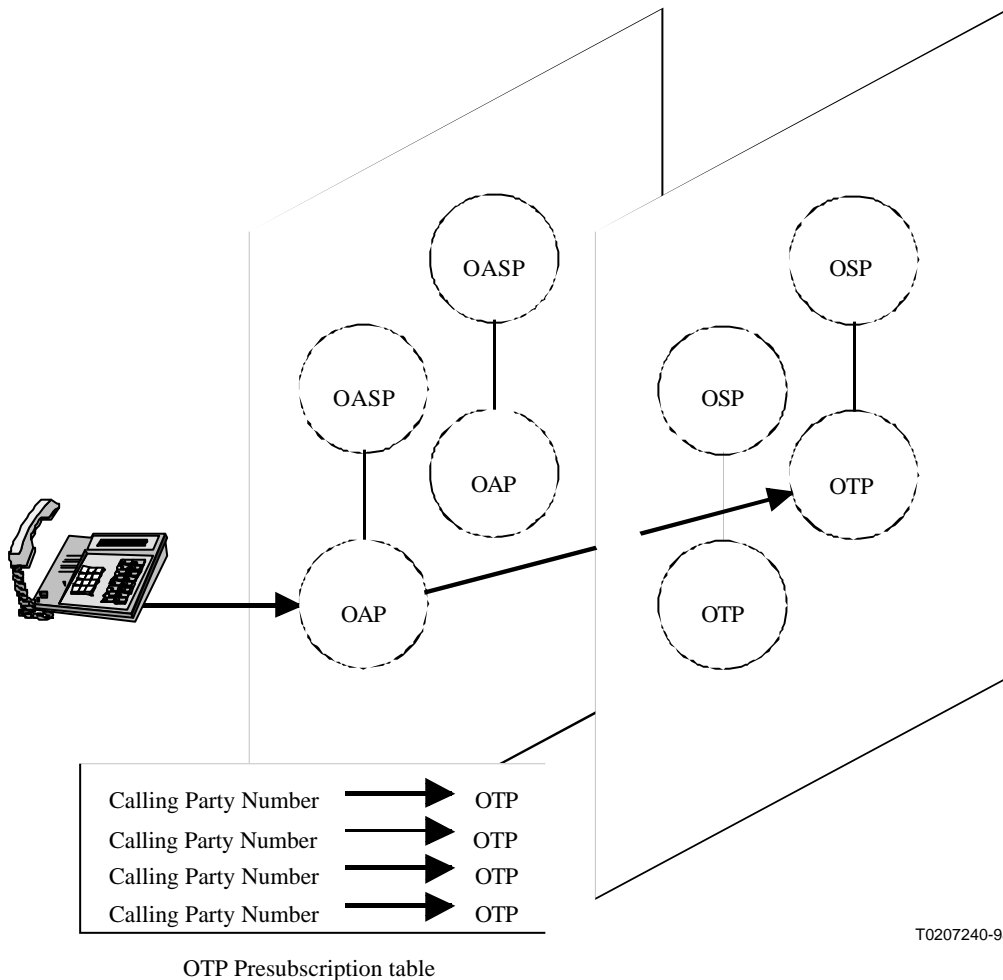
The following diagrams utilize the functional model, showing implementations to clarify carrier selection. Each of the cases discussed shows only a voice-path between entities. Some applications may use signalling paths between entities, but these are determined by the same carrier selection methods shown here. We have shown only selection of the connection carriers for simplicity, it is assumed the Service providers at each stage are either the same as the connection carrier or are determined by the connection carrier based on the selection information received.

Table 1 summarizes various methods of selecting the different carriers shown in the functional model.

**Table 1 – Carrier selection methods**

Selection of	Based on	Identification in	Controlled by
Originating Transport Provider (OTP)	Pre-subscription (Figure 2) Prefix (Figure 3) Number Analysis By OAP (Figure 4)	Subscriber Info Prefix, Signalling Number	Calling party Calling party Calling party

8.2.1.1 External to the number

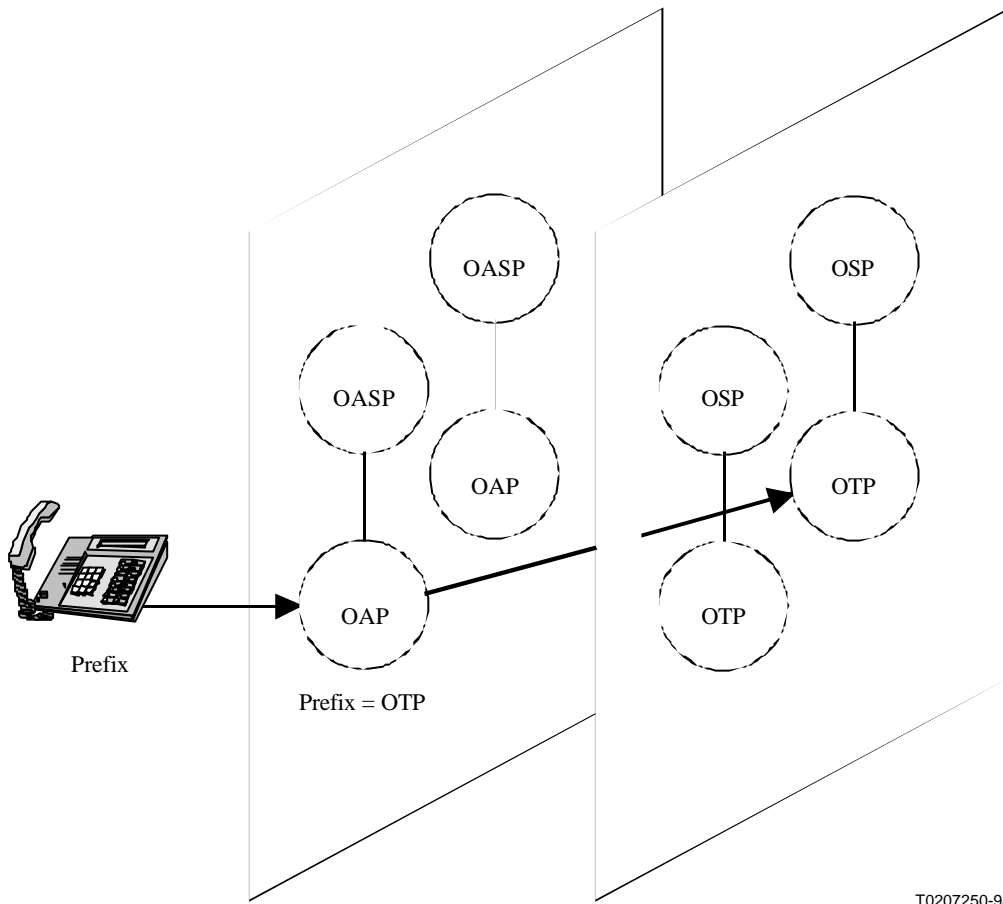


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**Figure 2 – Selection of OTP – Presubscription**

In Figure 2, the OAP performs the function of carrier selection through means of a provisioned pre-subscription table using the calling party number as the key. The data in this table is provisioned prior to the call being made on a line

basis in the carrier providing the OAP function and is used to determine the default carrier providing the OTP function for a call.



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**Figure 3 – Selection of OTP – Prefix**

In Figure 3, the OAP performs the function of carrier selection through means of a dialed prefix. In addition to being dialed, the carrier selection information could also be populated in the call set-up message by the calling party's equipment. The OAP translates this information to determine the requested OTP.



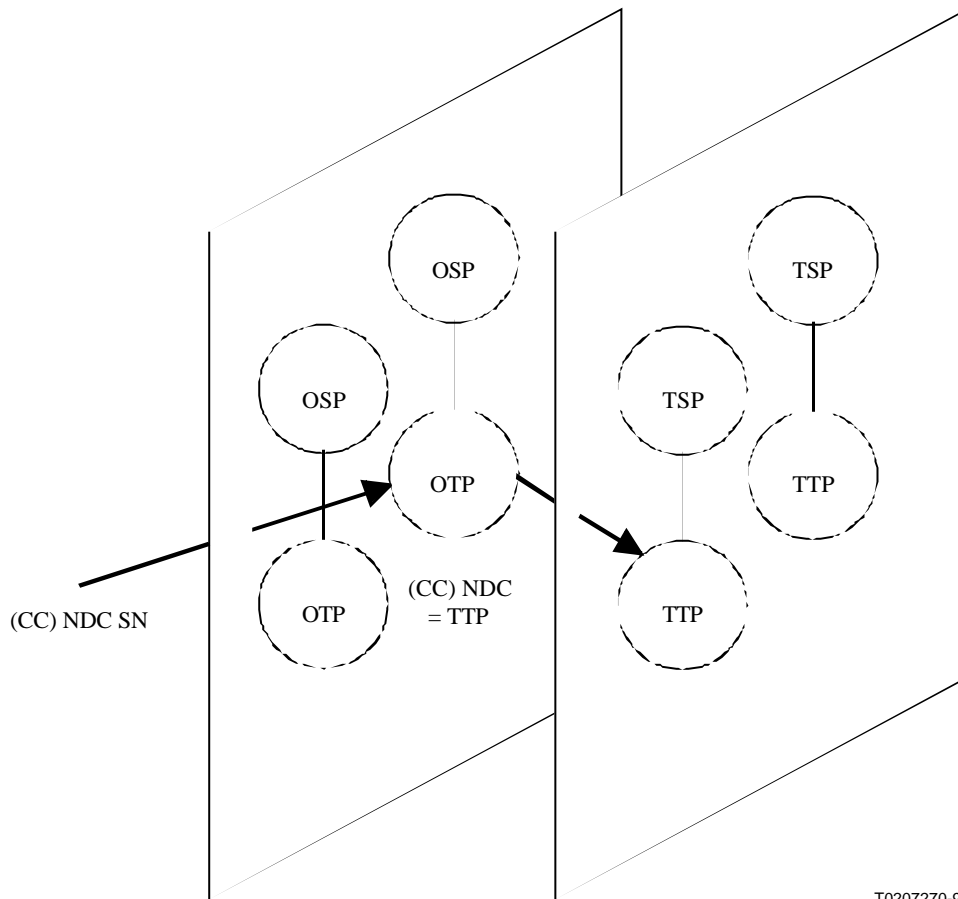
either the same as the connection network or are determined by the connection network based on the identification information received.

Table 2 summarizes various methods of network identification.

**Table 2 – Network identification methods**

<b>Selection of</b>	<b>Based on</b>	<b>Identification in</b>	<b>Controlled by</b>
Terminating Transport Provider (TTP)	Number Analysis By OTP (Figure 6)	Number	Called Party choice of Service provider
	Destination Number By OTP (Figure 5)	Number	Called Party choice of Service provider

**8.3.1.1 Internal to the number**

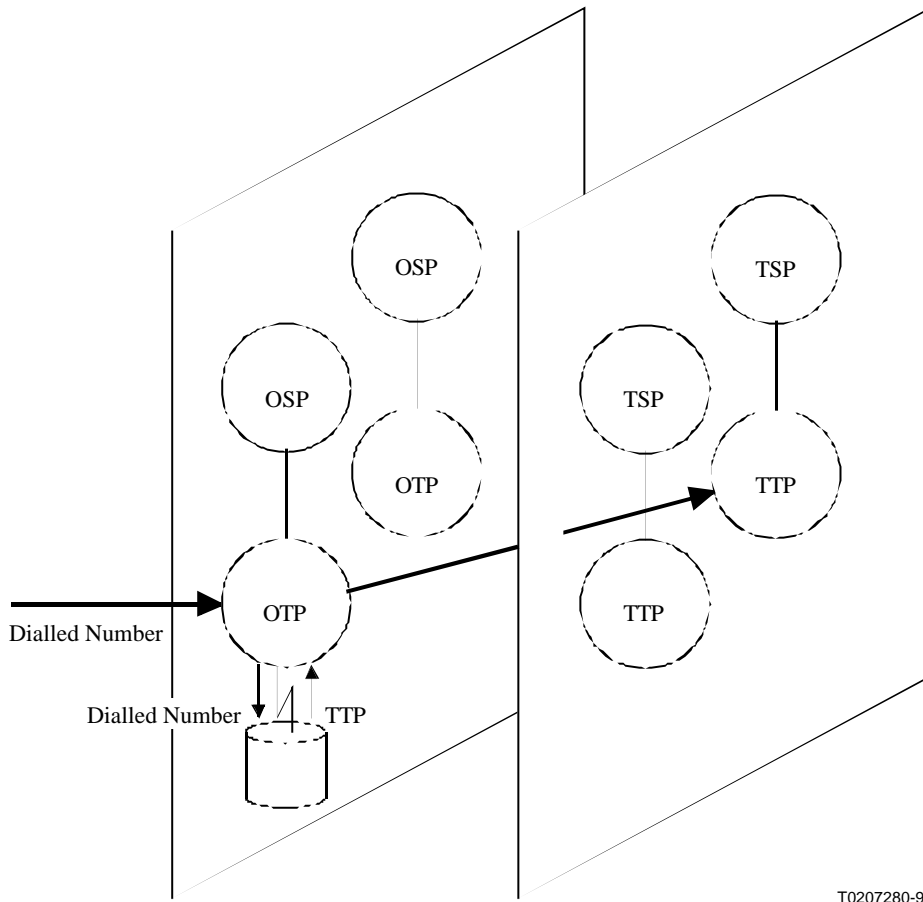


**Figure 5 – Identification of TTP – Destination number by OTP**



In Figure 5, the OTP performs the function of network identification through means of digit analysis of the destination number. The destination number contains a field which explicitly identifies the TTP. The OTP must recognize that the destination number contains explicit network identification, identify the field within the number containing that identification, and translate the value of the field to the appropriate TTP.

### 8.3.1.2 The complete number



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**Figure 6 – Identification of TTP – Number analysis by OTP**

In Figure 6, the OTP performs the function of network identification through means of analysis of the entire dialled number. The OTP must recognize that the destination number must be analyzed to determine the appropriate TTP, and perform analysis on the entire number.

## Annexure II

### **Directive 97/33/EC of the European Parliament and of the Council of 30 June 1997 on interconnection in Telecommunications with regard to ensuring universal service and interoperability through application of the principles of Open Network Provision (ONP)**

(31997L0033) *Official Journal L 199 , 26/07/1997 p. 0032 - 0052*

#### Article 1

##### Scope and aim

This Directive establishes a regulatory framework for securing in the Community the interconnection of telecommunications networks and in particular the interoperability of services, and with regard to ensuring provision of universal service in an environment of open and competitive markets. It concerns the harmonization of conditions for open and efficient interconnection of and access to public telecommunications networks and publicly available telecommunications services.

#### Article 2

##### Definitions

1. For the purposes of this Directive:

(a) 'interconnection' means the physical and logical linking of telecommunications networks used by the same or a different organization in order to allow the users of one organization to communicate with users of the same or another organization, or to access services provided by another organization. Services may be provided by the parties involved or other parties who have access to the network;

(b) 'public telecommunications network' means a telecommunications network used, in whole or in part, for the provision of publicly available telecommunications services;

(c) 'telecommunications network' means transmission systems and, where applicable, switching equipment and other resources which permit the conveyance of signals between defined termination points by wire, by radio, by optical or by other electromagnetic means;

(d) 'telecommunications services' means services whose provision consists wholly or partly in the transmission and routing of signals on telecommunications networks, with the exception of radio and television broadcasting;

(e) 'users' means individuals, including consumers or organizations, using or requesting publicly available telecommunications services;

(f) 'special rights' means rights that are granted by a Member State to a limited number of undertakings through any legislative, regulatory or administrative instrument which, within a given geographical area, limits to two or more the number of such undertakings authorized to provide a service or undertake an activity, otherwise than according to objective, proportionate and non-discriminatory criteria, or designates, otherwise than according to such criteria, several competing undertakings as being authorized to provide a service or undertake an activity, or confers, on any undertaking or undertakings, otherwise than according to such criteria, legal or regulatory advantages which substantially affect the ability of any other undertaking to provide the same service or to undertake the same activity in the same geographical area under substantially the same conditions;

(g) 'universal service' means a defined minimum set of services of specified quality which is available to all users independent of their geographical location and, in the light of specific national conditions, at an affordable price.

2. Further definitions given in Directive 90/387/EEC shall apply, where relevant.

#### Article 3

##### Interconnection at national and Community level

1. Member States shall take all necessary measures to remove any restrictions which prevent organizations authorized by Member States to provide public telecommunications networks and publicly available telecommunications services from negotiating interconnection agreements between themselves in accordance with Community law. The organizations concerned may be in the same Member State or in different Member States. Technical and commercial arrangements for interconnection shall be a matter for agreement between the parties involved, subject to the provisions of this Directive and the competition rules of the Treaty.

2. Member States shall ensure the adequate and efficient interconnection of the public telecommunications networks set out in [Annex I](#), to the extent necessary to ensure interoperability of these services for all users within the Community.

3. Member States shall ensure that organizations which interconnect their facilities to public telecommunications networks and/or publicly available telecommunications services respect at all times the confidentiality of information transmitted or stored.

#### Article 4

##### Rights and obligations for interconnection

1. Organizations authorized to provide public telecommunications networks and/or publicly available telecommunications services as set out in [Annex II](#) shall have a right and, when requested by organizations in that category, an obligation to negotiate interconnection with each other for the purpose of providing the services in question, in order to ensure provision of these networks and services throughout the Community. On a case-by-case basis, the national regulatory authority may agree to limit this obligation on a temporary basis and on the grounds that there are technically and commercially viable alternatives to the interconnection requested, and that the requested interconnection is inappropriate in relation to the resources available to meet the request. Any such limitation imposed by a national regulatory authority shall be fully reasoned and made public in accordance with Article 14 (2).

2. Organizations authorized to provide public telecommunications networks and publicly available telecommunications services as set out in [Annex I](#) which have significant market power shall meet all reasonable requests for access to the network including access at points other than the network termination points offered to the majority of end-users.

An organization shall be presumed to have significant market power when it has a share of more than 25 % of a particular telecommunications market in the geographical area in a Member State within which it is authorized to operate.

National regulatory authorities may nevertheless determine that an organization with a market share of less than 25 % in the relevant market has significant market power. They may also determine that an organization with a market share of more than 25 % in the relevant market does not have significant market power. In either case, the determination shall take into account the organization's ability to influence market conditions, its turnover relative to the size of the market, its control of the means of access to end-users, its access to financial resources and its experience in providing products and services in the market.

#### Article 5

##### Interconnection and universal service contributions

1. Where a Member State determines, in accordance with the provisions of this Article, that universal service obligations represent an unfair burden on an organization, it shall establish a mechanism for sharing the net cost of the universal service obligations with other organizations operating public telecommunications networks and/or publicly available voice telephony services. Member States shall take due account of the principles of transparency, non-discrimination and proportionality in setting the contributions to be made. Only public

telecommunications networks and publicly available telecommunications services as set out in Part 1 of Annex I may be financed in this way.

2. Contributions to the cost of universal service obligations if any may be based on a mechanism specifically established for the purpose and administered by a body independent of the beneficiaries, and/or may take the form of a supplementary charge added to the interconnection charge.

3. In order to determine the burden if any which the provision of universal service represents, organizations with universal service obligations shall, at the request of their national regulatory authority, calculate the net cost of such obligations in accordance with [Annex III](#). The calculation of the net cost of universal service obligations shall be audited by the national regulatory authority or another competent body, independent of the telecommunications organization, and approved by the national regulatory authority. The results of the cost calculation and the conclusions of the audit shall be open to the public in accordance with Article 14 (2).

4. Where justified on the basis of the net cost calculation referred to in paragraph 3, and taking into account the market benefit if any which accrues to an organization that offers universal service, national regulatory authorities shall determine whether a mechanism for sharing the net cost of universal service obligations is justified.

5. Where a mechanism for sharing the net cost of universal service obligations as referred to in paragraph 4 is established, national regulatory authorities shall ensure that the principles for cost sharing, and details of the mechanism used, are open to public inspection in accordance with Article 14 (2).

National regulatory authorities shall ensure that an annual report is published giving the calculated cost of universal service obligations, and identifying the contributions made by all the parties involved.

6. Until such time as the procedure described in paragraphs 3, 4 and 5 is implemented, any charges payable by an interconnected party which include or serve as a contribution to the cost of universal service obligations shall be notified, prior to their introduction, to the national regulatory authority. Without prejudice to Article 17 of this Directive, where the national regulatory authority finds, on its own initiative, or after a substantiated request by an interested party, that such charges are excessive, the organization concerned shall be required to reduce the relevant charges. Such reductions shall be applied retrospectively, from the date of introduction of the charges, but not before 1 January 1998.

## Article 6

### Non-discrimination and transparency

For interconnection to public telecommunications networks and publicly available telecommunications services as set out in [Annex I](#) provided by organizations which have been notified by national regulatory authorities as having significant market power, Member States shall ensure that:

- (a) the organizations concerned adhere to the principle of non-discrimination with regard to interconnection offered to others. They shall apply similar conditions in similar circumstances to interconnected organizations providing similar services, and shall provide interconnection facilities and information to others under the same conditions and of the same quality as they provide for their own services, or those of their subsidiaries or partners;
- (b) all necessary information and specifications are made available on request to organizations considering interconnection, in order to facilitate conclusion of an agreement; the information provided should include changes planned for implementation within the next six months, unless agreed otherwise by the national regulatory authority;

(c) interconnection agreements are communicated to the relevant national regulatory authorities, and made available on request to interested parties, in accordance with Article 14 (2), with the exception of those parts which deal with the commercial strategy of the parties. The national regulatory authority shall determine which parts deal with the commercial strategy of the parties. In every case, details of interconnection charges, terms and conditions and any contributions to universal service obligations shall be made available on request to interested parties;

(d) information received from an organization seeking interconnection is used only for the purpose for which it was supplied. It shall not be passed on to other departments, subsidiaries or partners for whom such information could provide a competitive advantage.

## Article 7

### Principles for interconnection charges and cost accounting systems

1. Member States shall ensure that the provisions of paragraphs 2 to 6 apply to organizations operating the public telecommunications networks and/or publicly available telecommunications services as set out in Parts 1 and 2 of [Annex I](#), which have been notified by national regulatory authorities as having significant market power.

2. Charges for interconnection shall follow the principles of transparency and cost orientation. The burden of proof that charges are derived from actual costs including a reasonable rate of return on investment shall lie with the organization providing interconnection to its facilities. National regulatory authorities may request an organization to provide full justification for its interconnection charges, and where appropriate shall require charges to be adjusted. This paragraph shall also apply to organizations set out in Part 3 of [Annex I](#) which have been notified by national regulatory authorities as having significant market power on the national market for interconnection.

3. National regulatory authorities shall ensure the publication, in accordance with Article 14 (1), of a reference interconnection offer. The reference interconnection offer shall include a description of the interconnection offerings broken down into components according to market needs, and the associated terms and conditions including tariffs. Different tariffs, terms and conditions for interconnection may be set for different categories of organizations which are authorized to provide networks and services, where such differences can be objectively justified on the basis of the type of interconnection provided and/or the relevant national licensing conditions. National regulatory authorities shall ensure that such differences do not result in distortion of competition, and in particular that the organization applies the appropriate interconnection tariffs, terms and conditions when providing interconnection for its own services or those of its subsidiaries or partners, in accordance with Article 6 (a).

The national regulatory authority shall have the ability to impose changes in the reference interconnection offer, where justified.

[Annex IV](#) provides a list of examples of elements for further elaboration of interconnection charges, tariff structures and tariff elements. Where an organization makes changes to the published reference interconnection offer, adjustments required by the national regulatory authority may be retrospective in effect, from the date of introduction of the change.

4. Charges for interconnection shall, in accordance with Community law, be sufficiently unbundled, so that the applicant is not required to pay for anything not strictly related to the service requested.

5. The Commission shall, acting in accordance with the procedure laid down in Article 15, draw up recommendations on cost accounting systems and accounting separation in relation to interconnection. National regulatory authorities shall ensure that the cost accounting systems used by the organizations concerned are suitable for implementation of the requirements of this Article, and are documented to a sufficient level of detail, as indicated in [Annex V](#). National regulatory authorities shall ensure that a description of the cost accounting system, showing the main categories under which costs are grouped and the rules used for the

allocation of costs to interconnection, is made available on request. Compliance with the cost accounting system shall be verified by the national regulatory authority or another competent body, independent of the telecommunications organization and approved by the national regulatory authority. A statement concerning compliance shall be published annually.

6. Where they exist, charges related to the sharing of the cost of universal service obligations, as described in Article 5, shall be unbundled and identified separately.

#### Article 8

##### Accounting separation and financial reports

1. Member States shall require organizations providing public telecommunications networks and/or publicly available telecommunications services which have special or exclusive rights for the provision of services in other sectors in the same or another Member State to keep separate accounts for the telecommunications activities, to the extent that would be required if the telecommunications activities in question were carried out by legally independent companies, so as to identify all elements of cost and revenue, with the basis of their calculation and the detailed attribution methods used, related to their telecommunications activities including an itemized breakdown of fixed asset and structural costs, or to have structural separation for the telecommunications activities. Member States may choose not to apply the requirements referred to in the first subparagraph to these organizations where their annual turnover in telecommunications activities in the Community is less than the limit set in Part 1 of [Annex VI](#).

2. Member States shall require organizations operating public telecommunications networks and/or publicly available telecommunications services as set out in Parts 1 and 2 of Annex I and notified by national regulatory authorities as organizations having significant market power which provide public telecommunications networks and/or telecommunications services available for users and which offer interconnection services to other organizations, to keep separate accounts for, on the one hand, their activities related to interconnection - covering both interconnection services provided internally and interconnection services provided to others - and, on the other hand, other activities, so as to identify all elements of cost and revenue, with the basis of their calculation and the detailed attribution methods used, related to their interconnection activity, including an itemized breakdown of fixed asset and structural costs.

Member States may choose not to apply the requirements referred to in the first subparagraph to organizations where their annual turnover in telecommunications activities in the Member States is less than the limit set in Part 2 of [Annex VI](#).

3. Organizations providing public telecommunications networks and/or publicly available telecommunications services shall provide financial information to their national regulatory authority promptly on request and to the level of detail required. National regulatory authorities may publish such information as would contribute to an open and competitive market, while taking account of considerations of commercial confidentiality.

4. The financial reports of organizations providing public telecommunications networks or publicly available telecommunications services shall be drawn up and submitted to independent audit and published. The audit shall be carried out in accordance with the relevant rules of national legislation.

The first subparagraph shall also apply to the separate accounts required in paragraphs 1 and 2.

#### Article 9

##### General responsibilities of the national regulatory authorities

1. National regulatory authorities shall encourage and secure adequate interconnection in the interests of all users, exercising their responsibility in a way that provides maximum economic efficiency and gives the maximum benefit to end-users. In particular, national regulatory authorities shall take into account:

- the need to ensure satisfactory end-to-end communications for users,
- the need to stimulate a competitive market,
- the need to ensure the fair and proper development of a harmonized European telecommunication market,
- the need to cooperate with their counterparts in other Member States,
- the need to promote the establishment and development of trans-European networks and services, and the interconnection of national networks and interoperability of services, as well as access to such networks and services,
- the principles of non-discrimination (including equal access) and proportionality,
- the need to maintain and develop universal service.

2. General conditions set down in advance by the national regulatory authority shall be published in accordance with Article 14 (1). In particular, in relation to interconnection between organizations set out in [Annex II](#), national regulatory authorities:

- may set ex ante conditions in the areas listed in Part 1 of [Annex VII](#);
- shall encourage coverage in interconnection agreements of the issues listed in Part 2 of Annex VII.

3. In pursuit of the aims stated in paragraph 1, national regulatory authorities may intervene on their own initiative at any time, and shall do so if requested by either party, in order to specify issues which must be covered in an interconnection agreement, or to lay down specific conditions to be observed by one or more parties to such an agreement. National regulatory authorities may, in exceptional cases, require changes to be made to interconnection agreements already concluded, where justified to ensure effective competition and/or interoperability of services for users.

Conditions set by the national regulatory authority may include inter alia conditions designed to ensure effective competition, technical conditions, tariffs, supply and usage conditions, conditions as to compliance with relevant standards, compliance with essential requirements, protection of the environment, and/or the maintenance of end-to-end quality of service. The national regulatory authority may, on its own initiative at any time or if requested by either party, also set time limits within which negotiations on interconnection are to be completed. If agreement is not reached within the time allowed, the national regulatory authority shall take steps to bring about an agreement under procedures laid down by that authority. The procedures shall be open to the public in accordance with Article 14 (2).

4. Where an organization authorized to provide public telecommunications networks or publicly available telecommunications services enters into interconnection agreements with others, the national regulatory authority shall have the right to inspect all such interconnection agreements in their entirety.

5. In the event of an interconnection dispute between organizations in a Member State, the national regulatory authority of that Member State shall, at the request of either party, take steps to resolve the dispute within six months of this request. The resolution of the dispute shall represent a fair balance between the legitimate interests of both parties.

In so doing, the national regulatory authority shall take into account, inter alia:

- the user interest,
- regulatory obligations or constraints imposed on any of the parties,
- the desirability of stimulating innovative market offerings, and of providing users with a wide range of telecommunications services at a national and at a Community level,
- the availability of technically and commercially viable alternatives to the interconnection requested,
- the desirability of ensuring equal access arrangements,
- the need to maintain the integrity of the public telecommunications network and the interoperability of services,
- the nature of the request in relation to the resources available to meet the request,
- the relative market positions of the parties,
- the public interest (e.g. the protection of the environment),

- the promotion of competition,
- the need to maintain a universal service.

A decision on the matter by a national regulatory authority shall be made available to the public in accordance with national procedures. The parties concerned shall be given a full statement of the reasons on which it is based.

6. In cases where organizations which are authorized to provide public telecommunications networks and/or publicly available telecommunications services have not interconnected their facilities, national regulatory authorities, in compliance with the principle of proportionality and in the interest of users, shall be able, as a last resort, to require the organizations concerned to interconnect their facilities in order to protect essential public interests and, where appropriate, shall be able to set terms of interconnection.

#### Article 10

##### Essential requirements

Without prejudice to action which may be taken in accordance with Articles 3 (5) and 5 (3) of Directive 90/387/EEC, the essential requirements as specified in Article 3 (2) of Directive 90/387/EEC shall for the purpose of this Directive apply to interconnection to public telecommunications networks and/or publicly available telecommunications services as set out in points (a) to (d) of this Article.

Where the national regulatory authority imposes conditions based on essential requirements in interconnection agreements, these conditions shall be published in the manner laid down in Article 14 (1).

(a) Security of network operations: Member States shall take all necessary steps to ensure that the availability of public telecommunications networks and publicly available telecommunications services is maintained in the event of catastrophic network breakdown or in exceptional cases of force majeure, such as extreme weather, earthquakes, flood, lightning or fire.

In the event of the circumstances referred to in the first subparagraph, the bodies concerned shall make every endeavour to maintain the highest level of service to meet any priorities laid down by the competent national authorities.

The need to meet these requirements shall not constitute a valid reason for refusal to negotiate terms for interconnection.

Furthermore, the national regulatory authority shall ensure that any conditions for interconnection related to the security of networks as regards risk of accidents are proportionate and non-discriminatory in nature, and are based on objective criteria identified in advance.

(b) Maintenance of network integrity: Member States shall take all necessary steps to ensure that the integrity of public telecommunications networks is maintained. The need to maintain network integrity does not constitute a valid reason for refusal to negotiate terms for interconnection. The national regulatory authority shall ensure that any conditions for interconnection related to protection of network integrity are proportionate and non-discriminatory in nature, and are based on objective criteria identified in advance.

(c) Interoperability of services: Member States may impose conditions in interconnection agreements in order to ensure interoperability of services, including conditions designed to ensure satisfactory end-to-end quality. Such conditions may include implementation of specific technical standards, or specifications, or codes of conduct agreed by the market players.

(d) Protection of data: Member States may impose conditions in interconnection agreements in order to ensure the protection of data, to the extent necessary to ensure compliance with relevant regulatory provisions on the protection of data including protection of personal data, the confidentiality of information processed, transmitted or stored, and the protection of privacy, compatible with Community law.

#### Article 11

##### Collocation and facility sharing



Where an organization providing public telecommunications networks and/or publicly available telecommunications services has the right under national legislation to install facilities on, over or under public or private land, or may take advantage of a procedure for the expropriation or use of property, national regulatory authorities shall encourage the sharing of such facilities and/or property with other organizations providing telecommunications networks and publicly available services, in particular where essential requirements deprive other organizations of access to viable alternatives. Agreements for collocation or facility sharing shall normally be a matter for commercial and technical agreement between the parties concerned. The national regulatory authority may intervene to resolve disputes, as provided for in Article 9. Member States may impose facility and/or property sharing arrangements (including physical collocation) only after an appropriate period of public consultation during which all interested parties must be given an opportunity to express their views. Such arrangements may include rules for apportioning the costs of facility and/or property sharing.

#### Article 12 Numbering

1. Member States shall ensure the provision of adequate numbers and numbering ranges for all publicly available telecommunications services.
2. In order to ensure full interoperability of Europe-wide networks and services, Member States in accordance with the Treaty shall take all necessary steps to ensure the coordination of their national positions in international organizations and fora where numbering decisions are taken, taking into account possible future developments in numbering in Europe.
3. Member States shall ensure that national telecommunications numbering plans are controlled by the national regulatory authority, in order to guarantee independence from organizations providing telecommunications networks or telecommunications services and facilitate number portability. In order to ensure effective competition, national regulatory authorities shall ensure that the procedures for allocating individual numbers and/or numbering ranges are transparent, equitable and timely and the allocation is carried out in an objective, transparent and non-discriminatory manner. National regulatory authorities may lay down conditions for the use of certain prefixes or certain short codes, in particular where these are used for services of general public interest (e.g. freephone services, kiosk billed services, directory services, emergency services), or to ensure equal access.
4. National regulatory authorities shall ensure that the main elements of the national numbering plans, and all subsequent additions or amendments to them, are published in accordance with Article 14 (1), subject only to limitations imposed on the grounds of national security.
5. National regulatory authorities shall encourage the earliest possible introduction of the number portability facility whereby end-users who so request can retain their number(s) on the fixed public telephone network at a specific location independent of the organization providing service, and shall ensure that this facility is available at least in all major centres of population before 1 January 2003. In order to ensure that charges to consumers are reasonable, national regulatory authorities shall ensure that pricing for interconnection related to the provision of this facility is reasonable.
6. National regulatory authorities shall ensure that numbering plans and procedures are applied in a manner that gives fair and equal treatment to all providers of publicly available telecommunications services. In particular, Member States shall ensure that an organization allocated a range of numbers shall avoid undue discrimination in the number sequences used to give access to the services of other telecommunications operators.

#### Article 13 Technical standards

1. Without prejudice to Article 5 (3) of Directive 90/387/EEC whereby the implementation of specified European standards may be made compulsory, national regulatory authorities shall ensure that organizations providing public telecommunications networks or publicly available telecommunications services take full account of standards listed in the Official Journal of the European Communities as being suitable for the purpose of interconnection. In the absence of such standards, national regulatory authorities shall encourage the provision of technical interfaces for interconnection according to the standards or specifications listed below:

- standards adopted by European standardization bodies such as the European Telecommunications Standards Institute (ETSI) or the European Committee for Standardization/European Committee for Electrotechnical Standardization (CEN/CENELEC), or, in the absence of such standards,  
- international standards or recommendations adopted by the International Telecommunications Union (ITU), the International Organization for Standardization (ISO) or the International Electrotechnical Committee (IEC), or, in the absence of such standards,  
- national standards.

2. The Commission may, acting in accordance with the procedure laid down in Article 15, request standards for interconnection and access to be drawn up, where appropriate, by European standardization bodies. Reference to standards for interconnection and access may be published in the Official Journal of the European Communities in accordance with Article 5 of Directive 90/387/EEC.

#### Article 14

##### Publication of and access to information

1. With regard to the information identified in Article 7 (3), Article 9 (2), Article 10 and Article 12 (4), national regulatory authorities shall ensure that up-to-date information is published in an appropriate manner in order to provide easy access to that information for interested parties. Reference shall be made in the national Official Gazette of the Member State concerned to the manner in which this information is published.

2. With regard to the information identified in Article 4 (1), Article 5 (3), Article 5 (5), Article 6 (c) and Article 9 (3), national regulatory authorities shall ensure that up-to-date specific information referred to in those Articles is made available on request to interested parties, free of charge, during normal working hours. Reference shall be made in the national Official Gazette of the Member State concerned to the times and location(s) at which the information is available.

3. Member States shall notify to the Commission before 1 January 1998 - and immediately thereafter in case of any change - the manner in which the information referred to in paragraphs 1 and 2 is made available. The Commission shall regularly publish a corresponding reference to such notifications in the Official Journal of the European Communities.

#### Article 15

##### Advisory Committee procedure

1. The Commission shall be assisted by the committee set up by Article 9 (1) of Directive 90/387/EEC, hereinafter referred to as the 'ONP Committee'.

2. The representative of the Commission shall submit to the committee a draft of the measures to be taken. The committee shall deliver its opinion on the draft, within a time limit which the chairman may lay down according to the urgency of the matter, if necessary by taking a vote.

3. The opinion shall be recorded in the minutes; in addition, each Member State shall have the right to ask to have its position recorded in the minutes. The Commission shall take the utmost account of the opinion delivered by the committee. It shall inform the committee of the manner in which its opinion has been taken into account.

#### Article 16

## Regulatory Committee procedure

1. Notwithstanding the provisions of Article 15, the following procedure shall apply in respect of the matters covered by Article 19.

2. The representative of the Commission shall submit to the committee a draft of the measures to be taken. The committee shall deliver its opinion on the draft within a time limit which the chairman may lay down according to the urgency of the matter. The opinion shall be delivered by the majority laid down in Article 148 (2) of the Treaty in the case of decisions which the Council is required to adopt on a proposal from the Commission. The votes of the representatives of the Member States within the committee shall be weighted in the manner set out in that Article. The chairman shall not vote.

3. The Commission shall adopt the measures envisaged if they are in accordance with the opinion of the committee.

4. If the measures envisaged are not in accordance with the opinion of the committee, or if no opinion is delivered, the Commission shall, without delay, submit to the Council a proposal relating to the measures to be taken. The Council shall act by a qualified majority. If on the expiry of a period of three months from the date of referral to the Council, the Council has not acted, the proposed measures shall be adopted by the Commission.

## Article 17

Procedure for resolving disputes between organizations operating under authorizations provided by different Member States

1. Without prejudice to:  
(a) any action that the Commission or any Member State may take pursuant to the Treaty;  
(b) the rights of the party invoking the procedure in paragraphs 2 and 3, of the organizations concerned or of any other party under applicable national law; the procedure set out in paragraphs 2 and 3 shall be available for the resolution of interconnection disputes between organizations operating under authorizations granted by different Member States, where such dispute does not fall within the responsibility of a single national regulatory authority exercising its power in accordance with Article 9.

2. Any party having a complaint against another organization over interconnection may refer the complaint to the national regulatory authority of the Member State that has granted the authorization of the organization against which the complaint is made. The national regulatory authority shall take steps to resolve the dispute in accordance with the procedures and timescale set out in Article 9 (5).

3. Where there are concurrent disputes between the same two organizations, the national regulatory authorities concerned shall, on request of either party in dispute, coordinate their efforts in order to bring about resolution of the disputes, in accordance with the principles set out in Article 9 (1), within 6 months of referral. The solutions shall represent a fair balance between the legitimate interests of both parties in dispute and be consistent with interconnection rules in the Member States concerned, in conformity with Community law.

## Article 18

Notification

1. Member States shall ensure that national regulatory authorities have the necessary means for carrying out the tasks identified in this Directive, and shall notify to the Commission by 31 January 1997 the national regulatory authorities responsible for those tasks.

2. National regulatory authorities shall notify to the Commission by 31 January 1997, and immediately thereafter in the event of any change, the names of those organizations which:  
- have universal service obligations for the provision of the public telecommunications networks and publicly available telecommunications services set out in Part 1 of Annex I and which are

authorized to collect directly a contribution to the net cost of universal service under the procedure in Article 5 (2),  
- are subject to the provisions of this Directive concerning organizations with significant market power,  
- are covered by Annex II.  
The Commission may request national regulatory authorities to provide their reasons for classifying an organization as having or not having significant market power.

3. The Commission shall publish the names referred to in paragraph 2 in the Official Journal of the European Communities.

#### Article 19

##### Technical adjustment

Modifications necessary to adapt [Annexes](#) IV, V and VII to the Directive to new technological developments or to changes in market and consumer demand shall be determined by the Commission in accordance with the procedure laid down in Article 16.

#### Article 20

##### Deferment

1. Deferment of the obligations under Articles 3 (1), 3 (2), 4 (1), 4 (2), 9 (1) and 9 (3) insofar as those obligations concern direct interconnection between the mobile networks of that Member State and the fixed or mobile networks of other Member States, and under Article 5, shall be granted to those Member States identified in the Council Resolutions of 22 July 1993 and 22 December 1994 which benefit from an additional transition period for the liberalization of telecommunications services for as long as and to the extent that they avail themselves of such transition periods. Member States shall inform the Commission of their intention to make use of them.

2. Deferment of the obligations under Article 12 (5) may be requested where the Member State concerned can prove that they would impose an excessive burden on certain organizations or classes of organization. The Member State shall inform the Commission of the reasons for requesting a deferment, the date by which the requirements can be met, and the measures envisaged in order to meet this deadline. The Commission shall consider the request taking into account the particular situation in that Member State and the need to ensure a coherent regulatory environment at a Community level, and shall inform the Member State whether it deems that the particular situation in that Member State justifies a deferment and, if so, until which date such deferment is justified.

#### Article 21

##### Interconnection with third country organizations

1. Member States may inform the Commission of any general difficulties encountered, de jure or de facto, by Community organizations in interconnecting with organizations in third countries, which have been brought to their attention.

2. Whenever the Commission is informed of the existence of such difficulties, the Commission may, if necessary, submit proposals to the Council for an appropriate mandate for negotiation of comparable rights for Community organizations in these third countries. The Council shall decide by qualified majority.

3. Measures taken pursuant to paragraph 2 shall be without prejudice to the Community's and Member States' obligations under relevant international agreements.

#### Article 22

##### Review

1. The Commission shall report to the European Parliament and to the Council by 31 December 1997, and periodically thereafter, on the availability of rights to interconnect in third countries for the benefit of Community organizations.

2. The Commission shall examine and report periodically to the European Parliament and to the Council on the functioning of this Directive, on the first occasion not later than 31 December 1999. For this purpose, the Commission may request information from the Member States. The report shall examine what provisions of this Directive should be adapted in the light of the developments in the market, the evolution of technology and the changes in user demand, in particular:

(a) for the provisions under Article 5,

(b) to confirm the timetable laid down in Article 12 (5).

The Commission shall also investigate in the report the added value of the setting up of a European Regulatory Authority to carry out those tasks which would prove to be better undertaken at Community level.

#### Article 23

##### Transposition

1. Member States shall bring into force the laws, regulations and administrative provisions necessary to comply with this Directive by 31 December 1997. They shall immediately inform the Commission thereof. When Member States adopt these provisions, these shall contain a reference to this Directive or shall be accompanied by such reference at the time of their official publication. The procedure for such reference shall be adopted by Member States.

2. Member States shall communicate to the Commission the texts of the main provisions of national law which they adopt in the field covered by this Directive.

#### Article 24

##### Entry into force

This Directive shall enter into force on the twentieth day following that of its publication in the Official Journal of the European Communities.

#### Article 25

##### Addressees

This Directive is addressed to the Member States.

Done at Brussels, 30 June 1997.

For the European Parliament

For the Council

The President  
J. M. GIL-ROBLES

The President  
A. NUIS

## ANNEX I

### SPECIFIC PUBLIC TELECOMMUNICATIONS NETWORKS AND PUBLICLY AVAILABLE TELECOMMUNICATIONS SERVICES

(referred to in Article 3 (2))

The following public telecommunications networks and publicly available telecommunications services are considered of major importance at European level. Organizations providing the public telecommunications networks and/or publicly available services identified below which have significant market power are subject to specific obligations with regard to interconnection and access, as specified in Articles 4 (2), 6 and 7.

#### Part 1

The fixed public telephone network

The fixed public telephone network means the public switched telecommunications network which supports the transfer between network termination points at fixed locations of speech and 3,1 kHz bandwidth audio information, to support inter alia:

- voice telephony,
- facsimile Group III communications, in accordance with ITU-T Recommendations in the 'T-series',
- voice band data transmission via modems at a rate of at least 2 400 bit/s, in accordance with

ITU-T Recommendations in the 'V-series'.

Access to the end-user's network termination point is via a number or numbers in the national numbering plan.

The fixed public telephone service according to Directive 95/62/EC of the European Parliament and of the Council of 13 December 1995 on the application of open network provision (ONP) to voice telephony [\(1\)](#).

The fixed public telephone service means the provision to end-users at fixed locations of a service for the originating and receiving of national and international calls, and may include access to emergency (112) services, the provision of operator assistance, directory services, provision of public pay phones, provision of service under special terms and/or provision of special facilities for customers with disabilities or with special social needs.

Access to the end-user is via a number or numbers in the national numbering plan.

#### Part 2

The leased lines service  
Leased lines means the telecommunications facilities which provide for transparent transmission capacity between network termination points, and which do not include on-demand switching (switching functions which the user can control as part of the leased line provision). They may include systems which allow flexible use of the leased line bandwidth, including certain routing and management capabilities.

#### Part 3

Public mobile telephone networks  
A public mobile telephony network is a public telephone network where the network termination points are not at fixed locations.

Public mobile telephone services  
A public mobile telephone service is a telephony service whose provision consists, wholly or partly, in the establishment of radiocommunications to one mobile user, and makes use wholly or partly of a public mobile telephone network.

## **ANNEX II**

### **ORGANIZATIONS WITH RIGHTS AND OBLIGATIONS TO NEGOTIATE INTERCONNECTION WITH EACH OTHER IN ORDER TO ENSURE COMMUNITY-WIDE SERVICES**

(referred to in Article 4 (1))

This Annex covers those organizations which provide switched and unswitched bearer capabilities to users upon which other telecommunications services depend. Organizations in the following categories have both rights and obligations to interconnect with each other, in accordance with Article 4 (1). Interconnection between these organizations is subject to additional supervision by national regulatory authorities, in accordance with Article 9 (2). Special interconnection charges, terms and conditions may exist for these categories of organizations in accordance with Article 7 (3).

1. Organizations which provide fixed and/or mobile public switched telecommunications networks and/or publicly available telecommunications services, and in so doing control the means of access to one or more network termination points identified by one or more unique numbers in the national numbering plan. (See notes below).
2. Organizations which provide leased lines to users' premises.
3. Organizations which are authorized in a Member State to provide international telecommunications circuits between the Community and third countries, for which purpose they have exclusive or special rights.
4. Organizations providing telecommunications services which are permitted in this category to interconnect in accordance with relevant national licensing or authorization schemes.

#### **Notes**

Control of the means of access to a network termination point means the ability to control the telecommunications services available to the end-user at that network termination point and/or the ability to deny other service providers access to the end-user at the network termination point.

Control of the means of access may entail ownership or control of the physical link to the end-user (whether wire or wireless), and/or the ability to change or withdraw the national number or numbers needed to access an end-user's network termination point.

### ANNEX III

#### CALCULATING THE COST OF UNIVERSAL SERVICE OBLIGATIONS FOR VOICE TELEPHONY

(referred to in Article 5 (3))

Universal service obligations refer to those obligations placed upon an organization by a Member State which concern the provision of a network and service throughout a specified geographical area, including - where required - averaged prices in that geographical area for the provision of that service. The cost of universal service obligations shall be calculated as the difference between the net cost for an organization of operating with the universal service obligations and operating without the universal service obligations. This applies whether the network in a particular Member State is fully developed or is still undergoing development and expansion. The calculation shall be based upon the costs attributable to:

- (i) elements of the identified services which can only be provided at a loss or provided under cost conditions falling outside normal commercial standards. This category may include service elements such as access to emergency telephone services, provision of certain public pay telephones, provision of certain services or equipment for disabled people, etc.
- (ii) specific end-users or groups of end-users who, taking into account the cost of providing the specified network and service, the revenue generated and any geographical averaging of prices imposed by the Member State, can only be served at a loss or under cost conditions falling outside normal commercial standards. This category includes those end-users or groups of end-users which would not be served by a commercial operator which did not have an obligation to provide universal service. In peripheral regions with expanding networks, the cost calculation should be based on the additional cost of serving those end-users or groups of end-users which an operator applying the normal commercial principles of a competitive environment would choose not to serve. Revenues shall be taken into account in calculating the net costs. Costs and revenues should be forward-looking.



#### **ANNEX IV**

#### **LIST OF EXAMPLES OF ELEMENTS FOR INTERCONNECTION CHARGES (referred to in Article 7 (3))**

Interconnection charges refer to the actual charges payable by interconnected parties. The tariff structure refers to the broad categories into which interconnection charges are divided,

- charges to cover initial implementation of the physical interconnection, based on the costs of providing the specific interconnection requested (e.g. specific equipment and resources; compatibility testing),
- rental charges to cover the on-going use of equipment and resources (connection maintenance, etc.),
- variable charges for ancillary and supplementary services (e.g. access to directory services; operator assistance; data collection; charging; billing; switch-based and advanced services etc.),
- traffic related charges, for the conveyance of traffic to and from the interconnected network (e.g. the costs of switching and transmission), which may be on a per minute basis, and/or on the basis of additional network capacity required.

Tariff elements refer to the individual prices set for each network component or facility provided to the interconnected party.

Tariffs and charges for interconnection must follow the principles of cost orientation and transparency, in accordance with Article 7 (2).

Interconnection charges may include a fair share, according to the principle of proportionality, of joint and common costs and the costs incurred in providing equal access, and number portability, and the costs of ensuring essential requirements (maintenance of the network integrity; network security in cases of emergency; interoperability of services; and protection of data).

**ANNEX V**  
**COST ACCOUNTING SYSTEMS FOR INTERCONNECTION**  
(referred to in Article 7 (5))

Article 7 (5) calls for details of the cost accounting system; the list below indicates, by way of example, some elements which may be included in such accounting systems. The purpose of publishing this information is to provide transparency in the calculation of interconnection charges, so that other market players are in a position to ascertain that the charges have been fairly and properly calculated. This objective should be taken into account by the national regulatory authority and the organizations affected when determining the level of detail in the information published. The list below indicates the elements to be included in the information published.

1. The cost standard used e.g. fully distributed costs, long-run average incremental costs, marginal costs, stand-alone costs, embedded direct costs, etc. including the cost base(s) used, i.e. historic costs (based on actual expenditure incurred for equipment and systems) or forward-looking costs (based on estimated replacement costs of equipment or systems).

2. The cost elements included in the interconnection tariff  
Identification of all the individual cost components which together make up the interconnection charge, including the profit element.

3. The degrees and methods of cost allocation, in particular the treatment of joint and common costs

Details of the degree to which direct costs are analyzed, and the degree and method by which joint and common costs are included in interconnection charges

4. Accounting conventions  
i.e. the accounting conventions used for the treatment of costs covering:  
- the timescale for depreciation of major categories of fixed asset (e.g. land, buildings, equipment, etc.),  
- the treatment, in terms of revenue versus capital cost, of other major expenditure items (e.g. computer software and systems, research and development, new business development, direct and indirect construction, repairs and maintenance, finance charges, etc.)

The information on cost accounting systems, as identified in this Annex, may be amended in accordance with the procedure referred to in Article 19.

**ANNEX VI**

**THRESHOLDS FOR TELECOMMUNICATIONS TURNOVER**  
(referred to in Article 8 (1) and 8 (2))

Part 1

The threshold for annual turnover in telecommunications activities referred to in Article 8 (1) shall be fifty million ecus. (ECU 50 million)

Part 2

The threshold for annual turnover in telecommunications activities referred to in Article 8 (2) shall be twenty million ecus. (ECU 20 million)

## **ANNEX VII**

### **FRAMEWORK FOR NEGOTIATION OF INTERCONNECTION AGREEMENTS**

(referred to in Article 9 (2))

#### **Part 1**

Areas where the national regulatory authority may set ex ante conditions

- (a) Dispute resolution procedure,
- (b) Requirements for publication/access to interconnection agreements and other periodic publication duties,
- (c) Requirements for the provision of equal access and number portability,
- (d) Requirements to provide facility sharing, including collocation,
- (e) Requirements to ensure the maintenance of essential requirements,
- (f) Requirements for allocation and use of numbering resources (including access to directory services, emergency services and pan-European numbers),
- (g) Requirements concerning the maintenance of end-to-end quality of service,
- (h) Where applicable, determination of the unbundled part of the interconnection charge which represents a contribution to the net cost of universal service obligations.

#### **Part 2**

Other issues, the coverage of which in interconnection agreements is to be encouraged

- (a) Description of interconnection services to be provided,
- (b) Terms of payment, including billing procedures,
- (c) Locations of the points of interconnection,
- (d) Technical standards for interconnection,
- (e) Interoperability tests,
- (f) Measures to comply with essential requirements,
- (g) Intellectual property rights,
- (h) Definition and limitation of liability and indemnity,
- (i) Definition of interconnection charges and their evolution over time,
- (j) Dispute resolution procedure between parties before requesting national regulatory authority intervention,
- (k) Duration and renegotiation of agreements,
- (l) Procedure in the event of alterations being proposed to the network or service offerings of one of the parties,
- (m) Achievement of equal access,
- (n) Provision of facility sharing,
- (o) Access to ancillary, supplementary and advanced services,
- (p) Traffic/network management,
- (q) Maintenance and quality of interconnection services,
- (r) Confidentiality of non-public parts of the agreements,
- (s) Training of staff.

**ADDITIONAL**  
**ANNEXURES**  
**To**

**Consultation Paper 2001/5**

**Issues Relating to Interconnection between**  
**Access Providers and**  
**National Long Distance Operators**

**Dated 14 Dec. 2001**

## **ANNEXURE I**

### **Supplement 1 to Recommendation E.164**

### **ALTERNATIVES FOR CARRIER SELECTION AND NETWORK IDENTIFICATION**

*(Geneva, 1998)*

#### **1 INTRODUCTION**

The changing telecommunications environment has enhanced the importance of being able to choose the Service providers which perform functions on a call. This ability to designate a specific Service provider for a specific portion of a call may be achieved through the use of a prefix, presubscription, signalling, database analysis, or embedding the identification in the number itself. At each hand-off point of a call, the current provider must determine the next provider to which to route the call (provider determination).

#### **2 SCOPE**

This supplement presents a summary of the potential methods for Carrier / Service provider selection and network identification on the public network. The guidance provided may be utilized for both international and national implementations.

This supplement does not specifically address the class of provider determination methods based on contractual agreements, bilateral negotiations, transit routes, or previous traffic (proportional routing). These methods are used by individual providers in determining the next provider to which to route the call.

#### **2 ASSUMPTIONS**

The following is a list of basic assumptions used in generating this supplement.

In considering Carrier Selection and Network Identification techniques methodologies that use information within the signalling should be considered. Information within this supplement is based on current needs and technologies but not at the expense of future needs and technology.

Where a competitive environment is not present, normal call set-up should not be impacted by Carrier Selection techniques.

## 4 REFERENCES

- ITU-T Recommendation E.164 (1997), The international public telecommunication numbering plan.

## 5 DEFINITIONS

The term **carrier selection** is used when the decision is controlled by the **calling party**, and the term **network identification** is used when the decision is controlled by the **called party**. This supplement uses a functional model of network Services to provide a framework for examples of both carrier selection and network identification.

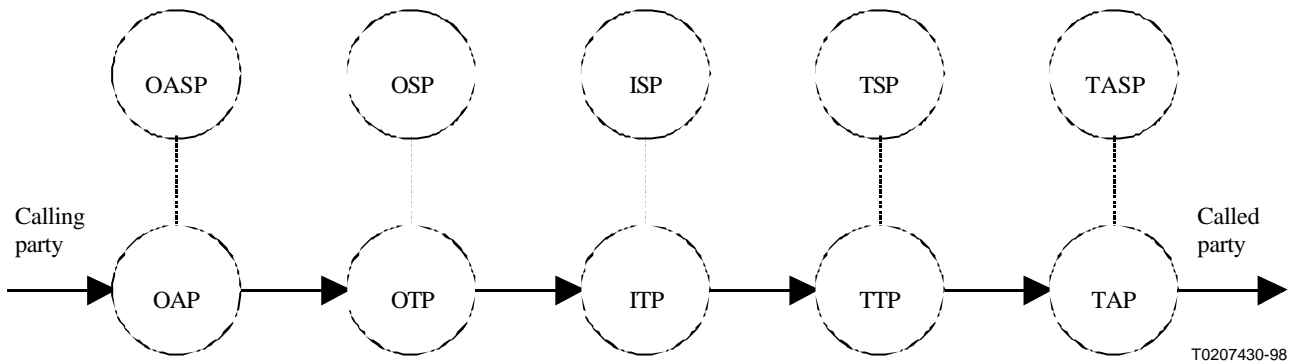
The word "Carrier" in this supplement included both "Access Provider" and "Transport Provider".

## 6 ACRONYMS

This supplement uses the following acronyms.

ISP	Intermediate Service Provider(s)
ITP	Intermediate Transport Provider(s)
OAP	Originating Access Provider(s)
OASP	Originating Access Service Provider(s)
OSP	Originating Service Provider(s)
OTP	Originating Transport Providers(s)
TAP	Terminating Access Provider(s)
TASP	Terminating Access Service Provider(s)
TSP	Terminating Service Provider(s)
TTP	Terminating Transport Provider(s)

## 7 FUNCTIONAL MODELS



**Figure 1 – Functional model**

In discussing issues related to carrier selection/network identification, it is useful to address them in the context of a general model. The model shown (see Figure 1) illustrates the entities and relationships involved in a call. This is a functional model and hence the entities shown are not necessarily distinct companies.

The functions provided in network Service are: connection to/from the network, transport through the network, and Service features. These functions are provided to the calling party (originating) and the called party (terminating). Each provider offering connection or transport may provide Service features or access to an entity providing Service features.

For a call, the calling party connects to the network through the Originating Access Provider (OAP). The OAP determines the Originating Transport Provider (OTP) to carry the call forward via voice path or signalling. The OTP progresses the call to the Terminating Transport Provider (TTP) which could be done via an Intermediate Service Provider (ISP), (e.g. who may provide transit transport Services). The TTP routes the call to the called party through the Terminating Access Provider (TAP). Any one or all of these connection providers could provide access to a Service provider offering features to the calling or called parties.

It is important to re-emphasize that these are functional entities. One carrier could function as multiple entities on a given call. There could be multiple instances of one entity on a given call.



## **8 ALTERNATIVES**

### **8.1 General options for Carrier Selection and Network Identification in relation to E.164 numbers**

For Carriers and Networks, it may be necessary to identify the Carrier/Network which is providing a specific Service. There are three basic methods that can be used to identify Carriers/Networks in relation to E.164 numbers. These options are:

- a) the implementation of Carrier Selection and Network Identification external to the E.164 number;
- b) the implementation of Network Identification internal to the E.164 Number;
- c) the implementation of the complete E.164 Number as a means of identification of the Carrier/Network.

#### **8.1.1 GENERAL CONSIDERATIONS FOR NETWORK IDENTIFICATION IN RELATION TO THE E.164 NUMBER**

The choice of implementation of one of the above methods should be done on the basis of evaluating each individual Service. It will be selected based on Service and operational requirements for each Service application. In some applications, specific recommendations should be made for a preferred method of Carrier Selection and Network Identification using particular numbering resources. In other cases, specific recommendations on the Carrier Selection and Network Identification method should be left as a national matter.

The following is a list of general issues to be evaluated when considering all three Carrier Selection and Network Identification methodologies.

**a) *Timing and equipment availability***

The choice of a particular Carrier Selection and Network Identification approach can be impacted by the time frame (i.e. the requested date) when the Service for which the numbering resources are required. This is because the availability of hardware and software to support the specific Carrier Selection and Network Identification scheme can have an impact on the Carrier Selection and Network Identification method that is selected.

**b) *Impact on network interconnections and interworking***

In choosing a Carrier Selection and Network Identification methodology, the issues of network interconnection and interworking between

networks and carriers should be considered. For example, should a subscriber dial an E.164 number destined to a Carrier or Network other than the network or carrier from which the call originates, then certain inter-working arrangements must be in place for the call to be routed and billed. The apportionment of international traffic between Carriers/Networks may also be impacted once Carrier Selection and Network Identification is associated with an E.164 number.

The transport of Carrier Selection and Network identification information between networks may also be necessary.

**c) *Impact on retaining or discarding Carrier Selection and Network Identification information***

Carrier Selection and Network Identification information is necessary to determine the routing and settlement arrangements for international calls. The nature of a given call type (e.g. calling or called party paid) will determine the need to retain or discard the Carrier Selection and Network Identification information as an international call is routed to its destination address.

**8.1.2 CONSIDERATIONS FOR CARRIER SELECTION/NETWORK IDENTIFICATION OPTIONS**

The following sub-clauses contain specific considerations applying to each of the above three Carrier Selection and Network Identification options.

**8.1.2.1 Considerations for applying the Carrier Selection and Network Identification external to the E.164 number**

It may be possible to use either prefixes or suffixes in dialling E.164 Numbers. The Carrier Selection and Network Identification may also take place in the call related signalling information external to the number. Pre-subscription to a carrier may be one method. Another method may be to allow a subscriber to change their pre-subscription by dialling a short code (on a semi-permanent basis).

Some ramifications of this approach are:

- a) No portion of the numbering space is used for Carrier Selection and Network Identification, and therefore the carrier selection and network identification does not impact the quantity, format or makeup of the numbers.
- b) Additional digits may be dialled (e.g. a prefix or suffix).

- c) All digit combinations (used for the prefix or suffix) are available unless they are already assigned or apportioned for other uses.
- d) Service Provider Portability of Numbers is feasible under this Carrier Selection and Network Identification option.
- e) Modifications to existing signalling protocol may be required to transmit the Carrier Selection and Network Identification identifiers. This may be achieved by using the transit network selection parameter in existing signalling Recommendations.
- f) The calling party must dial the correct information in addition to the E.164 number.

### **8.1.2.2 Considerations for applying Network Identification internal to the E.164 number**

When identifying the Carrier Selection and Network Identification internal to the E.164 number for particular applications, the following implications should be considered:

- a) **Impact on efficient use of the quantity of available numbers:**

If a portion of the E.164 number is used for Network Identification, then the numbering space is divided into some finite quantity of carrier or network identification groupings. Under each such grouping, a block of numbers is then assigned to individual networks. The efficient use of these E.164 number allocations is dependent on the utilization of the numbers under each network Identification allocation. Should some networks not assign many numbers, the overall efficiency in utilizing these resources may be low. This may lead to premature exhaust of the specific E.164 numbering resource.

- b) **Trade off between Network Identifiers and quantity of subscriber numbers per Network:**

The designation for Network Identification purposes of some quantity of digits in the E.164 number reduces the number of available digits for subscriber numbers and limits the quantity of numbers that any one Network has available for assignment to its particular customer base. The quantity of Network specific numbers is inversely proportional to the number of networks that can be identified within the number.

- c) **Service provider portability is precluded:**

When an E.164 number contains Network specific identification, the flexibility to change Service providers and maintain the same number is lost.

- d) **Routing to the appropriate network is facilitated in an efficient fashion.**

- e) No additional digits are required when an E.164 number is dialled.
- f) From a subscriber's perspective, no additional signalling information is required from the calling user for Network Identification beyond the E.164 number. From a network perspective, no additional signalling information is required for Network Identification beyond the E.164 number if every network node involved in the call correctly interprets the internal E.164 field designated for network identification.
- g) No additional knowledge is required by the calling party beyond the number itself to convey Network Identification information.

### **8.1.2.3 Use of the complete E.164 number as a means to achieve Carrier Selection and Network Identification**

Recommendations E.164 and E.162 require networks to do analysis on seven (7) digits for international calls. Using the complete E.164 number as a means of achieving Carrier Selection and Network Identification requires that the originating network have the ability to analyze the entire Number (up to 15 digits) to determine the particular Carrier Selection and Network Identification. This may require a database lookup capability for E.164 numbers of up to 15 digits in length.

- a) No portion of the numbering space is used for Carrier Selection and Network Identification, and therefore the Carrier Selection and Network Identification does not impact the quantity, format or makeup of the numbers.
- b) All the E.164 numbers can be used and mapped for Carrier Selection and Network Identification unless they are already assigned to some other application.
- c) Service Provider Portability of Numbers is feasible under this Carrier Selection and Network Identification option.
- d) Modifications to existing signalling protocol may be required to transmit the Carrier Selection and Network Identification information.
- e) Routing to the appropriate carrier/network may need database lookup.
- f) No additional digits are required when an E.164 number is dialled.
- g) No additional knowledge is required by the calling party beyond the number itself to obtain Carrier Selection or Network Identification information.

## **8.2 Selection by calling party**

### **8.2.1 FUNCTIONAL DESCRIPTION**

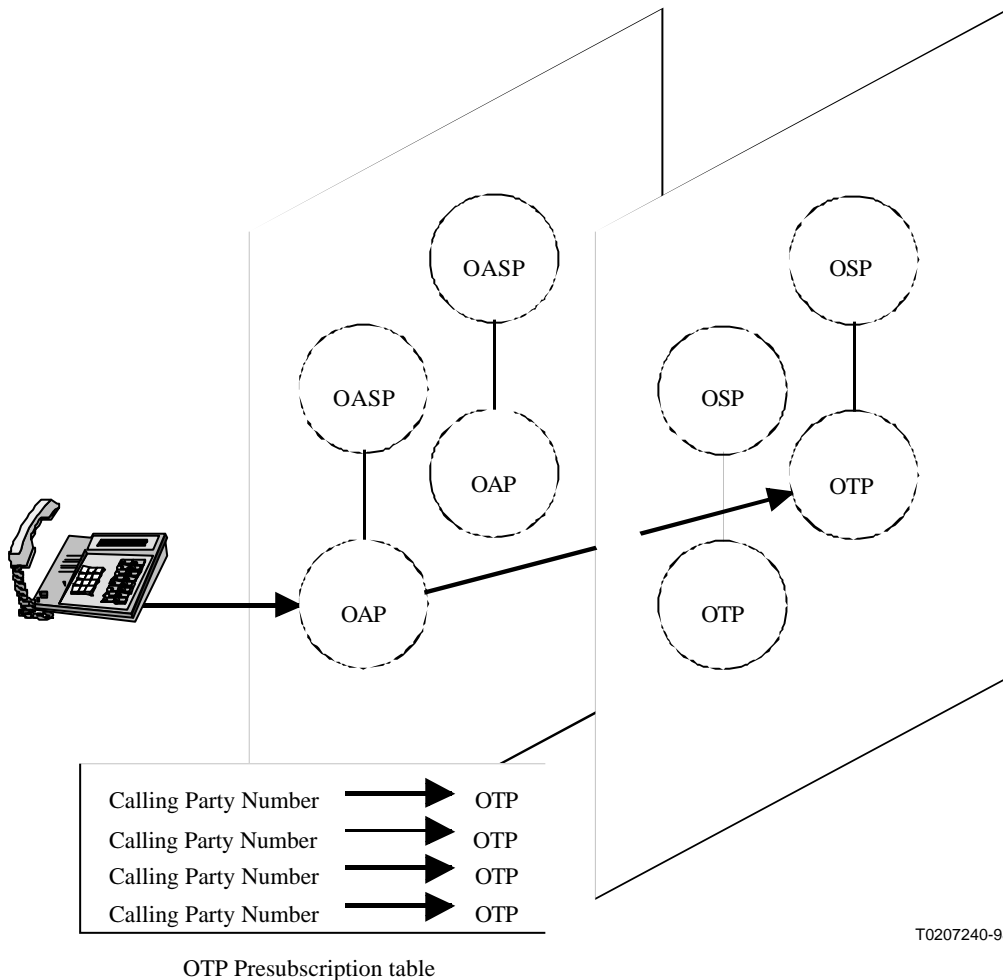
The following diagrams utilize the functional model, showing implementations to clarify carrier selection. Each of the cases discussed shows only a voice-path between entities. Some applications may use signalling paths between entities, but these are determined by the same carrier selection methods shown here. We have shown only selection of the connection carriers for simplicity, it is assumed the Service providers at each stage are either the same as the connection carrier or are determined by the connection carrier based on the selection information received.

Table 1 summarizes various methods of selecting the different carriers shown in the functional model.

**Table 1 – Carrier selection methods**

Selection of	Based on	Identification in	Controlled by
Originating Transport Provider (OTP)	Pre-subscription (Figure 2) Prefix (Figure 3) Number Analysis By OAP (Figure 4)	Subscriber Info Prefix, Signalling Number	Calling party Calling party Calling party

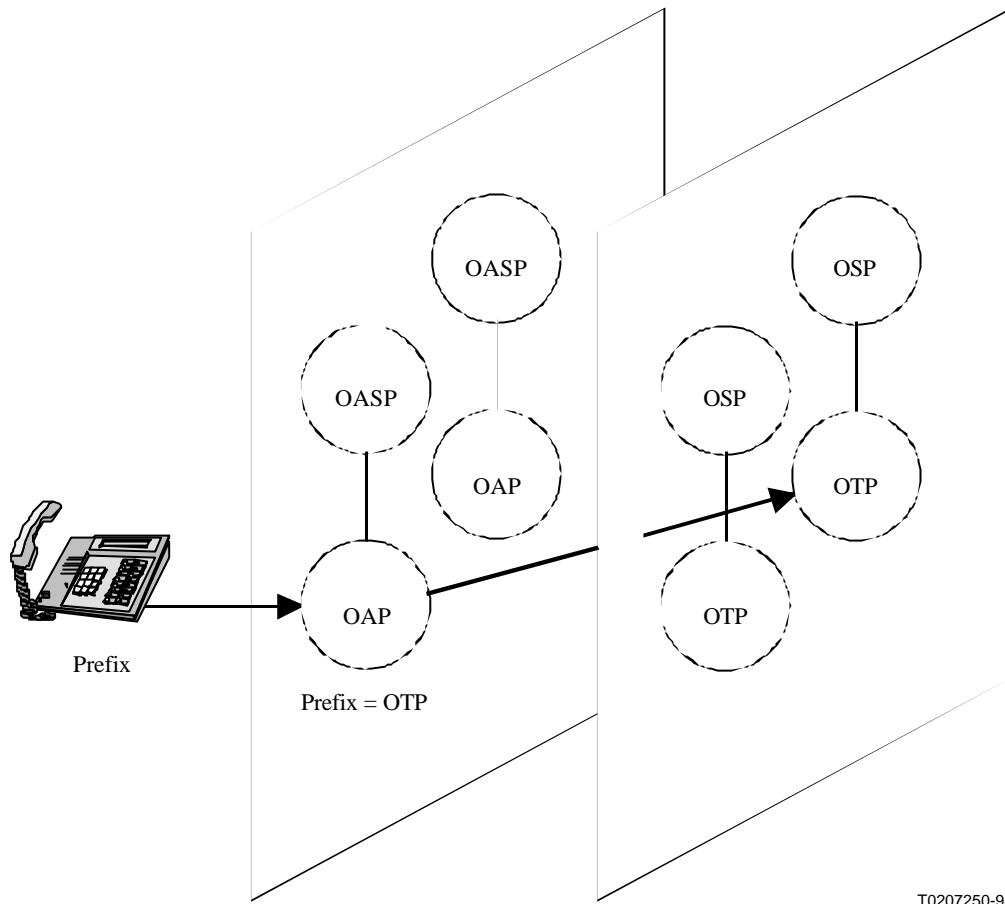
8.2.1.1 External to the number



**Figure 2 – Selection of OTP – Presubscription**

In Figure 2, the OAP performs the function of carrier selection through means of a provisioned pre-subscription table using the calling party number as the key. The data in this table is provisioned prior to the call being made on a line

basis in the carrier providing the OAP function and is used to determine the default carrier providing the OTP function for a call.

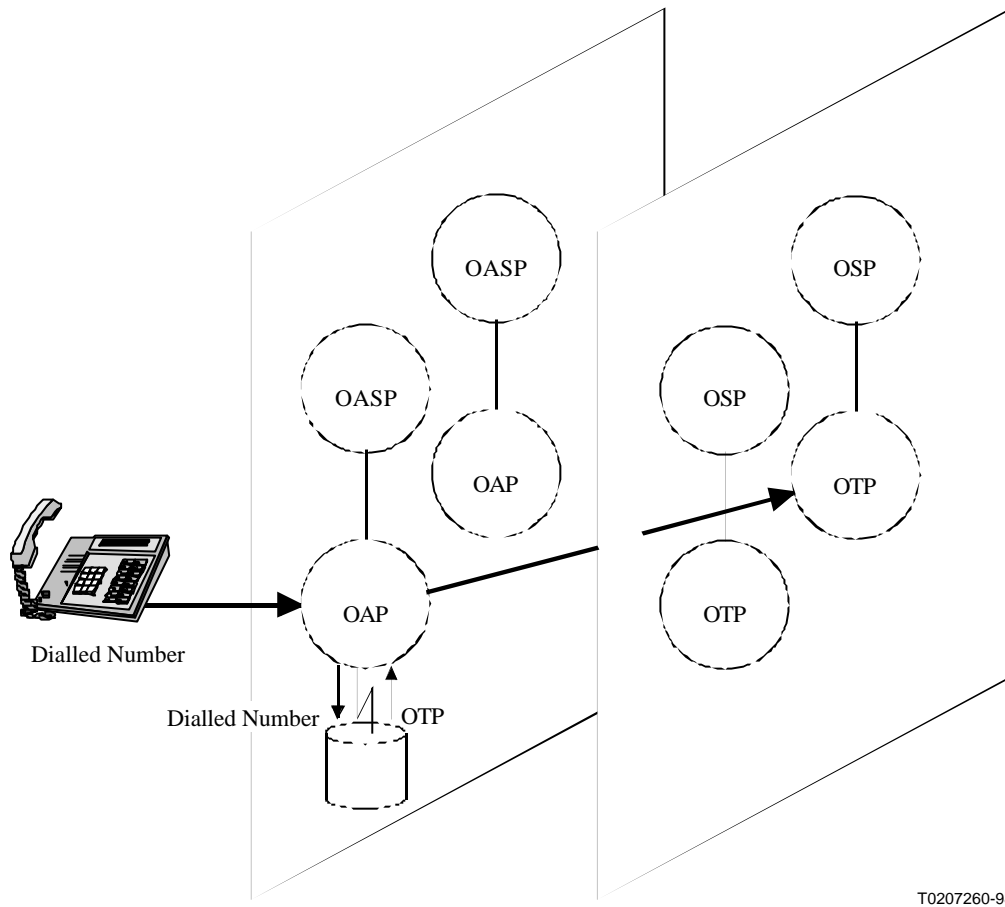


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**Figure 3 – Selection of OTP – Prefix**

In Figure 3, the OAP performs the function of carrier selection through means of a dialed prefix. In addition to being dialed, the carrier selection information could also be populated in the call set-up message by the calling party's equipment. The OAP translates this information to determine the requested OTP.

### 8.2.1.2 The complete number



**Figure 4 – Selection of OTP – Number analysis by OAP**

In Figure 4, the OAP performs the function of carrier selection through means of analysis of the dialled number to determine the requested OTP.

## 8.3 Selection by the Called Party

### 8.3.1 FUNCTIONAL DESCRIPTION

The following diagrams utilize the functional model, showing implementations to clarify network identification. Each of the cases discussed shows only a voice-path between entities. Some applications may use signalling paths between entities, but these are determined by the same network identification methods shown here. We have shown only identification of the connection networks for simplicity – it is assumed the Service providers at each stage are



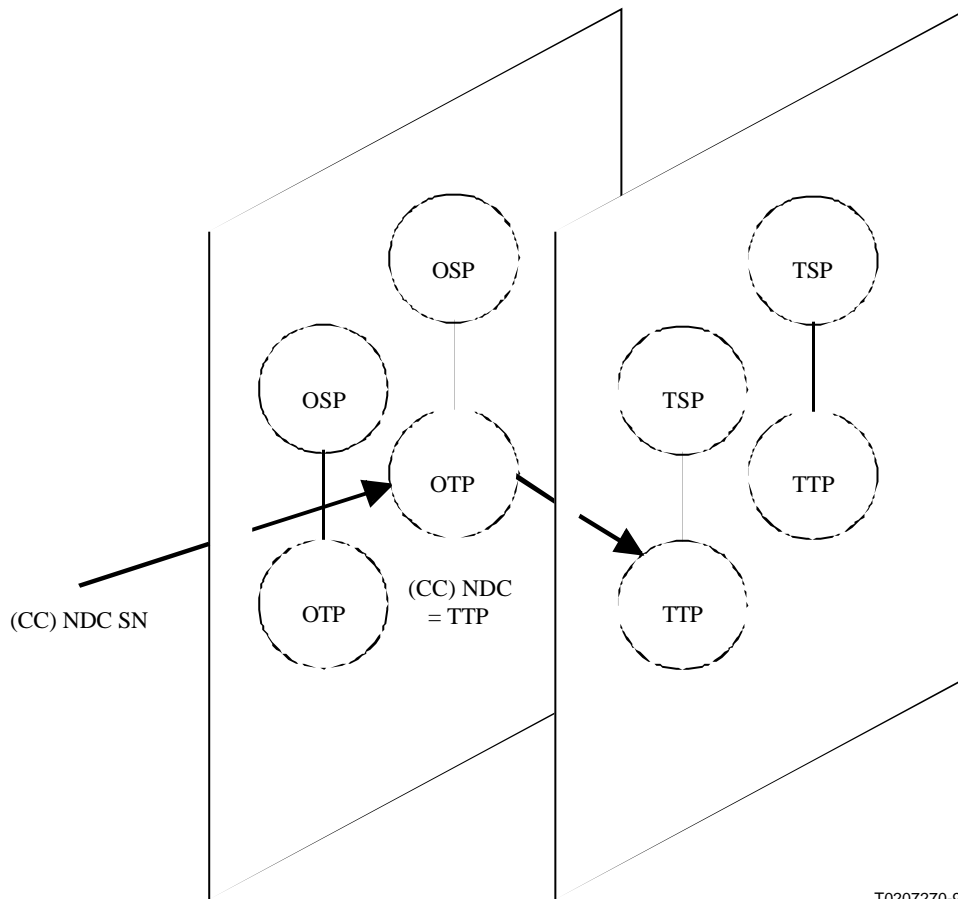
either the same as the connection network or are determined by the connection network based on the identification information received.

Table 2 summarizes various methods of network identification.

**Table 2 – Network identification methods**

<b>Selection of</b>	<b>Based on</b>	<b>Identification in</b>	<b>Controlled by</b>
Terminating Transport Provider (TTP)	Number Analysis By OTP (Figure 6)	Number	Called Party choice of Service provider
	Destination Number By OTP (Figure 5)	Number	Called Party choice of Service provider

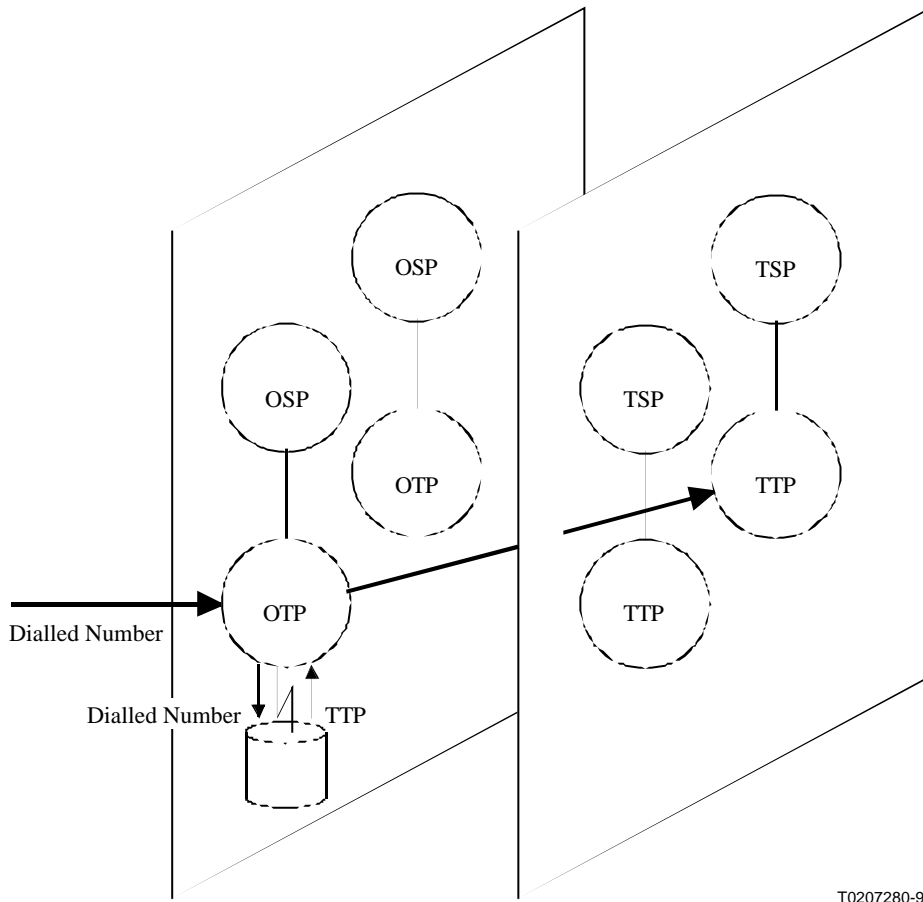
**8.3.1.1 Internal to the number**



**Figure 5 – Identification of TTP – Destination number by OTP**

In Figure 5, the OTP performs the function of network identification through means of digit analysis of the destination number. The destination number contains a field which explicitly identifies the TTP. The OTP must recognize that the destination number contains explicit network identification, identify the field within the number containing that identification, and translate the value of the field to the appropriate TTP.

### 8.3.1.2 The complete number



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**Figure 6 – Identification of TTP – Number analysis by OTP**

In Figure 6, the OTP performs the function of network identification through means of analysis of the entire dialled number. The OTP must recognize that the destination number must be analyzed to determine the appropriate TTP, and perform analysis on the entire number.

## Annexure II

### **Directive 97/33/EC of the European Parliament and of the Council of 30 June 1997 on interconnection in Telecommunications with regard to ensuring universal service and interoperability through application of the principles of Open Network Provision (ONP)**

(31997L0033) *Official Journal L 199 , 26/07/1997 p. 0032 - 0052*

#### Article 1

##### Scope and aim

This Directive establishes a regulatory framework for securing in the Community the interconnection of telecommunications networks and in particular the interoperability of services, and with regard to ensuring provision of universal service in an environment of open and competitive markets. It concerns the harmonization of conditions for open and efficient interconnection of and access to public telecommunications networks and publicly available telecommunications services.

#### Article 2

##### Definitions

1. For the purposes of this Directive:

(a) 'interconnection' means the physical and logical linking of telecommunications networks used by the same or a different organization in order to allow the users of one organization to communicate with users of the same or another organization, or to access services provided by another organization. Services may be provided by the parties involved or other parties who have access to the network;

(b) 'public telecommunications network' means a telecommunications network used, in whole or in part, for the provision of publicly available telecommunications services;

(c) 'telecommunications network' means transmission systems and, where applicable, switching equipment and other resources which permit the conveyance of signals between defined termination points by wire, by radio, by optical or by other electromagnetic means;

(d) 'telecommunications services' means services whose provision consists wholly or partly in the transmission and routing of signals on telecommunications networks, with the exception of radio and television broadcasting;

(e) 'users' means individuals, including consumers or organizations, using or requesting publicly available telecommunications services;

(f) 'special rights' means rights that are granted by a Member State to a limited number of undertakings through any legislative, regulatory or administrative instrument which, within a given geographical area, limits to two or more the number of such undertakings authorized to provide a service or undertake an activity, otherwise than according to objective, proportionate and non-discriminatory criteria, or designates, otherwise than according to such criteria, several competing undertakings as being authorized to provide a service or undertake an activity, or confers, on any undertaking or undertakings, otherwise than according to such criteria, legal or regulatory advantages which substantially affect the ability of any other undertaking to provide the same service or to undertake the same activity in the same geographical area under substantially the same conditions;

(g) 'universal service' means a defined minimum set of services of specified quality which is available to all users independent of their geographical location and, in the light of specific national conditions, at an affordable price.

2. Further definitions given in Directive 90/387/EEC shall apply, where relevant.

#### Article 3

##### Interconnection at national and Community level

1. Member States shall take all necessary measures to remove any restrictions which prevent organizations authorized by Member States to provide public telecommunications networks and publicly available telecommunications services from negotiating interconnection agreements between themselves in accordance with Community law. The organizations concerned may be in the same Member State or in different Member States. Technical and commercial arrangements for interconnection shall be a matter for agreement between the parties involved, subject to the provisions of this Directive and the competition rules of the Treaty.

2. Member States shall ensure the adequate and efficient interconnection of the public telecommunications networks set out in [Annex I](#), to the extent necessary to ensure interoperability of these services for all users within the Community.

3. Member States shall ensure that organizations which interconnect their facilities to public telecommunications networks and/or publicly available telecommunications services respect at all times the confidentiality of information transmitted or stored.

#### Article 4

##### Rights and obligations for interconnection

1. Organizations authorized to provide public telecommunications networks and/or publicly available telecommunications services as set out in [Annex II](#) shall have a right and, when requested by organizations in that category, an obligation to negotiate interconnection with each other for the purpose of providing the services in question, in order to ensure provision of these networks and services throughout the Community. On a case-by-case basis, the national regulatory authority may agree to limit this obligation on a temporary basis and on the grounds that there are technically and commercially viable alternatives to the interconnection requested, and that the requested interconnection is inappropriate in relation to the resources available to meet the request. Any such limitation imposed by a national regulatory authority shall be fully reasoned and made public in accordance with Article 14 (2).

2. Organizations authorized to provide public telecommunications networks and publicly available telecommunications services as set out in [Annex I](#) which have significant market power shall meet all reasonable requests for access to the network including access at points other than the network termination points offered to the majority of end-users.

An organization shall be presumed to have significant market power when it has a share of more than 25 % of a particular telecommunications market in the geographical area in a Member State within which it is authorized to operate.

National regulatory authorities may nevertheless determine that an organization with a market share of less than 25 % in the relevant market has significant market power. They may also determine that an organization with a market share of more than 25 % in the relevant market does not have significant market power. In either case, the determination shall take into account the organization's ability to influence market conditions, its turnover relative to the size of the market, its control of the means of access to end-users, its access to financial resources and its experience in providing products and services in the market.

#### Article 5

##### Interconnection and universal service contributions

1. Where a Member State determines, in accordance with the provisions of this Article, that universal service obligations represent an unfair burden on an organization, it shall establish a mechanism for sharing the net cost of the universal service obligations with other organizations operating public telecommunications networks and/or publicly available voice telephony services. Member States shall take due account of the principles of transparency, non-discrimination and proportionality in setting the contributions to be made. Only public

telecommunications networks and publicly available telecommunications services as set out in Part 1 of Annex I may be financed in this way.

2. Contributions to the cost of universal service obligations if any may be based on a mechanism specifically established for the purpose and administered by a body independent of the beneficiaries, and/or may take the form of a supplementary charge added to the interconnection charge.

3. In order to determine the burden if any which the provision of universal service represents, organizations with universal service obligations shall, at the request of their national regulatory authority, calculate the net cost of such obligations in accordance with [Annex III](#). The calculation of the net cost of universal service obligations shall be audited by the national regulatory authority or another competent body, independent of the telecommunications organization, and approved by the national regulatory authority. The results of the cost calculation and the conclusions of the audit shall be open to the public in accordance with Article 14 (2).

4. Where justified on the basis of the net cost calculation referred to in paragraph 3, and taking into account the market benefit if any which accrues to an organization that offers universal service, national regulatory authorities shall determine whether a mechanism for sharing the net cost of universal service obligations is justified.

5. Where a mechanism for sharing the net cost of universal service obligations as referred to in paragraph 4 is established, national regulatory authorities shall ensure that the principles for cost sharing, and details of the mechanism used, are open to public inspection in accordance with Article 14 (2).

National regulatory authorities shall ensure that an annual report is published giving the calculated cost of universal service obligations, and identifying the contributions made by all the parties involved.

6. Until such time as the procedure described in paragraphs 3, 4 and 5 is implemented, any charges payable by an interconnected party which include or serve as a contribution to the cost of universal service obligations shall be notified, prior to their introduction, to the national regulatory authority. Without prejudice to Article 17 of this Directive, where the national regulatory authority finds, on its own initiative, or after a substantiated request by an interested party, that such charges are excessive, the organization concerned shall be required to reduce the relevant charges. Such reductions shall be applied retrospectively, from the date of introduction of the charges, but not before 1 January 1998.

## Article 6

### Non-discrimination and transparency

For interconnection to public telecommunications networks and publicly available telecommunications services as set out in [Annex I](#) provided by organizations which have been notified by national regulatory authorities as having significant market power, Member States shall ensure that:

- (a) the organizations concerned adhere to the principle of non-discrimination with regard to interconnection offered to others. They shall apply similar conditions in similar circumstances to interconnected organizations providing similar services, and shall provide interconnection facilities and information to others under the same conditions and of the same quality as they provide for their own services, or those of their subsidiaries or partners;
- (b) all necessary information and specifications are made available on request to organizations considering interconnection, in order to facilitate conclusion of an agreement; the information provided should include changes planned for implementation within the next six months, unless agreed otherwise by the national regulatory authority;

(c) interconnection agreements are communicated to the relevant national regulatory authorities, and made available on request to interested parties, in accordance with Article 14 (2), with the exception of those parts which deal with the commercial strategy of the parties. The national regulatory authority shall determine which parts deal with the commercial strategy of the parties. In every case, details of interconnection charges, terms and conditions and any contributions to universal service obligations shall be made available on request to interested parties;

(d) information received from an organization seeking interconnection is used only for the purpose for which it was supplied. It shall not be passed on to other departments, subsidiaries or partners for whom such information could provide a competitive advantage.

## Article 7

### Principles for interconnection charges and cost accounting systems

1. Member States shall ensure that the provisions of paragraphs 2 to 6 apply to organizations operating the public telecommunications networks and/or publicly available telecommunications services as set out in Parts 1 and 2 of [Annex I](#), which have been notified by national regulatory authorities as having significant market power.

2. Charges for interconnection shall follow the principles of transparency and cost orientation. The burden of proof that charges are derived from actual costs including a reasonable rate of return on investment shall lie with the organization providing interconnection to its facilities. National regulatory authorities may request an organization to provide full justification for its interconnection charges, and where appropriate shall require charges to be adjusted. This paragraph shall also apply to organizations set out in Part 3 of [Annex I](#) which have been notified by national regulatory authorities as having significant market power on the national market for interconnection.

3. National regulatory authorities shall ensure the publication, in accordance with Article 14 (1), of a reference interconnection offer. The reference interconnection offer shall include a description of the interconnection offerings broken down into components according to market needs, and the associated terms and conditions including tariffs. Different tariffs, terms and conditions for interconnection may be set for different categories of organizations which are authorized to provide networks and services, where such differences can be objectively justified on the basis of the type of interconnection provided and/or the relevant national licensing conditions. National regulatory authorities shall ensure that such differences do not result in distortion of competition, and in particular that the organization applies the appropriate interconnection tariffs, terms and conditions when providing interconnection for its own services or those of its subsidiaries or partners, in accordance with Article 6 (a).

The national regulatory authority shall have the ability to impose changes in the reference interconnection offer, where justified.

[Annex IV](#) provides a list of examples of elements for further elaboration of interconnection charges, tariff structures and tariff elements. Where an organization makes changes to the published reference interconnection offer, adjustments required by the national regulatory authority may be retrospective in effect, from the date of introduction of the change.

4. Charges for interconnection shall, in accordance with Community law, be sufficiently unbundled, so that the applicant is not required to pay for anything not strictly related to the service requested.

5. The Commission shall, acting in accordance with the procedure laid down in Article 15, draw up recommendations on cost accounting systems and accounting separation in relation to interconnection. National regulatory authorities shall ensure that the cost accounting systems used by the organizations concerned are suitable for implementation of the requirements of this Article, and are documented to a sufficient level of detail, as indicated in [Annex V](#). National regulatory authorities shall ensure that a description of the cost accounting system, showing the main categories under which costs are grouped and the rules used for the

allocation of costs to interconnection, is made available on request. Compliance with the cost accounting system shall be verified by the national regulatory authority or another competent body, independent of the telecommunications organization and approved by the national regulatory authority. A statement concerning compliance shall be published annually.

6. Where they exist, charges related to the sharing of the cost of universal service obligations, as described in Article 5, shall be unbundled and identified separately.

#### Article 8

##### Accounting separation and financial reports

1. Member States shall require organizations providing public telecommunications networks and/or publicly available telecommunications services which have special or exclusive rights for the provision of services in other sectors in the same or another Member State to keep separate accounts for the telecommunications activities, to the extent that would be required if the telecommunications activities in question were carried out by legally independent companies, so as to identify all elements of cost and revenue, with the basis of their calculation and the detailed attribution methods used, related to their telecommunications activities including an itemized breakdown of fixed asset and structural costs, or to have structural separation for the telecommunications activities. Member States may choose not to apply the requirements referred to in the first subparagraph to these organizations where their annual turnover in telecommunications activities in the Community is less than the limit set in Part 1 of [Annex VI](#).

2. Member States shall require organizations operating public telecommunications networks and/or publicly available telecommunications services as set out in Parts 1 and 2 of Annex I and notified by national regulatory authorities as organizations having significant market power which provide public telecommunications networks and/or telecommunications services available for users and which offer interconnection services to other organizations, to keep separate accounts for, on the one hand, their activities related to interconnection - covering both interconnection services provided internally and interconnection services provided to others - and, on the other hand, other activities, so as to identify all elements of cost and revenue, with the basis of their calculation and the detailed attribution methods used, related to their interconnection activity, including an itemized breakdown of fixed asset and structural costs.

Member States may choose not to apply the requirements referred to in the first subparagraph to organizations where their annual turnover in telecommunications activities in the Member States is less than the limit set in Part 2 of [Annex VI](#).

3. Organizations providing public telecommunications networks and/or publicly available telecommunications services shall provide financial information to their national regulatory authority promptly on request and to the level of detail required. National regulatory authorities may publish such information as would contribute to an open and competitive market, while taking account of considerations of commercial confidentiality.

4. The financial reports of organizations providing public telecommunications networks or publicly available telecommunications services shall be drawn up and submitted to independent audit and published. The audit shall be carried out in accordance with the relevant rules of national legislation.

The first subparagraph shall also apply to the separate accounts required in paragraphs 1 and 2.

#### Article 9

##### General responsibilities of the national regulatory authorities

1. National regulatory authorities shall encourage and secure adequate interconnection in the interests of all users, exercising their responsibility in a way that provides maximum economic efficiency and gives the maximum benefit to end-users. In particular, national regulatory authorities shall take into account:

- the need to ensure satisfactory end-to-end communications for users,
- the need to stimulate a competitive market,
- the need to ensure the fair and proper development of a harmonized European telecommunication market,
- the need to cooperate with their counterparts in other Member States,
- the need to promote the establishment and development of trans-European networks and services, and the interconnection of national networks and interoperability of services, as well as access to such networks and services,
- the principles of non-discrimination (including equal access) and proportionality,
- the need to maintain and develop universal service.

2. General conditions set down in advance by the national regulatory authority shall be published in accordance with Article 14 (1). In particular, in relation to interconnection between organizations set out in [Annex II](#), national regulatory authorities:

- may set ex ante conditions in the areas listed in Part 1 of [Annex VII](#);
- shall encourage coverage in interconnection agreements of the issues listed in Part 2 of Annex VII.

3. In pursuit of the aims stated in paragraph 1, national regulatory authorities may intervene on their own initiative at any time, and shall do so if requested by either party, in order to specify issues which must be covered in an interconnection agreement, or to lay down specific conditions to be observed by one or more parties to such an agreement. National regulatory authorities may, in exceptional cases, require changes to be made to interconnection agreements already concluded, where justified to ensure effective competition and/or interoperability of services for users.

Conditions set by the national regulatory authority may include inter alia conditions designed to ensure effective competition, technical conditions, tariffs, supply and usage conditions, conditions as to compliance with relevant standards, compliance with essential requirements, protection of the environment, and/or the maintenance of end-to-end quality of service. The national regulatory authority may, on its own initiative at any time or if requested by either party, also set time limits within which negotiations on interconnection are to be completed. If agreement is not reached within the time allowed, the national regulatory authority shall take steps to bring about an agreement under procedures laid down by that authority. The procedures shall be open to the public in accordance with Article 14 (2).

4. Where an organization authorized to provide public telecommunications networks or publicly available telecommunications services enters into interconnection agreements with others, the national regulatory authority shall have the right to inspect all such interconnection agreements in their entirety.

5. In the event of an interconnection dispute between organizations in a Member State, the national regulatory authority of that Member State shall, at the request of either party, take steps to resolve the dispute within six months of this request. The resolution of the dispute shall represent a fair balance between the legitimate interests of both parties.

In so doing, the national regulatory authority shall take into account, inter alia:

- the user interest,
- regulatory obligations or constraints imposed on any of the parties,
- the desirability of stimulating innovative market offerings, and of providing users with a wide range of telecommunications services at a national and at a Community level,
- the availability of technically and commercially viable alternatives to the interconnection requested,
- the desirability of ensuring equal access arrangements,
- the need to maintain the integrity of the public telecommunications network and the interoperability of services,
- the nature of the request in relation to the resources available to meet the request,
- the relative market positions of the parties,
- the public interest (e.g. the protection of the environment),



- the promotion of competition,
- the need to maintain a universal service.

A decision on the matter by a national regulatory authority shall be made available to the public in accordance with national procedures. The parties concerned shall be given a full statement of the reasons on which it is based.

6. In cases where organizations which are authorized to provide public telecommunications networks and/or publicly available telecommunications services have not interconnected their facilities, national regulatory authorities, in compliance with the principle of proportionality and in the interest of users, shall be able, as a last resort, to require the organizations concerned to interconnect their facilities in order to protect essential public interests and, where appropriate, shall be able to set terms of interconnection.

#### Article 10

##### Essential requirements

Without prejudice to action which may be taken in accordance with Articles 3 (5) and 5 (3) of Directive 90/387/EEC, the essential requirements as specified in Article 3 (2) of Directive 90/387/EEC shall for the purpose of this Directive apply to interconnection to public telecommunications networks and/or publicly available telecommunications services as set out in points (a) to (d) of this Article.

Where the national regulatory authority imposes conditions based on essential requirements in interconnection agreements, these conditions shall be published in the manner laid down in Article 14 (1).

(a) Security of network operations: Member States shall take all necessary steps to ensure that the availability of public telecommunications networks and publicly available telecommunications services is maintained in the event of catastrophic network breakdown or in exceptional cases of force majeure, such as extreme weather, earthquakes, flood, lightning or fire.

In the event of the circumstances referred to in the first subparagraph, the bodies concerned shall make every endeavour to maintain the highest level of service to meet any priorities laid down by the competent national authorities.

The need to meet these requirements shall not constitute a valid reason for refusal to negotiate terms for interconnection.

Furthermore, the national regulatory authority shall ensure that any conditions for interconnection related to the security of networks as regards risk of accidents are proportionate and non-discriminatory in nature, and are based on objective criteria identified in advance.

(b) Maintenance of network integrity: Member States shall take all necessary steps to ensure that the integrity of public telecommunications networks is maintained. The need to maintain network integrity does not constitute a valid reason for refusal to negotiate terms for interconnection. The national regulatory authority shall ensure that any conditions for interconnection related to protection of network integrity are proportionate and non-discriminatory in nature, and are based on objective criteria identified in advance.

(c) Interoperability of services: Member States may impose conditions in interconnection agreements in order to ensure interoperability of services, including conditions designed to ensure satisfactory end-to-end quality. Such conditions may include implementation of specific technical standards, or specifications, or codes of conduct agreed by the market players.

(d) Protection of data: Member States may impose conditions in interconnection agreements in order to ensure the protection of data, to the extent necessary to ensure compliance with relevant regulatory provisions on the protection of data including protection of personal data, the confidentiality of information processed, transmitted or stored, and the protection of privacy, compatible with Community law.

#### Article 11

##### Collocation and facility sharing

Where an organization providing public telecommunications networks and/or publicly available telecommunications services has the right under national legislation to install facilities on, over or under public or private land, or may take advantage of a procedure for the expropriation or use of property, national regulatory authorities shall encourage the sharing of such facilities and/or property with other organizations providing telecommunications networks and publicly available services, in particular where essential requirements deprive other organizations of access to viable alternatives. Agreements for collocation or facility sharing shall normally be a matter for commercial and technical agreement between the parties concerned. The national regulatory authority may intervene to resolve disputes, as provided for in Article 9. Member States may impose facility and/or property sharing arrangements (including physical collocation) only after an appropriate period of public consultation during which all interested parties must be given an opportunity to express their views. Such arrangements may include rules for apportioning the costs of facility and/or property sharing.

#### Article 12 Numbering

1. Member States shall ensure the provision of adequate numbers and numbering ranges for all publicly available telecommunications services.
2. In order to ensure full interoperability of Europe-wide networks and services, Member States in accordance with the Treaty shall take all necessary steps to ensure the coordination of their national positions in international organizations and fora where numbering decisions are taken, taking into account possible future developments in numbering in Europe.
3. Member States shall ensure that national telecommunications numbering plans are controlled by the national regulatory authority, in order to guarantee independence from organizations providing telecommunications networks or telecommunications services and facilitate number portability. In order to ensure effective competition, national regulatory authorities shall ensure that the procedures for allocating individual numbers and/or numbering ranges are transparent, equitable and timely and the allocation is carried out in an objective, transparent and non-discriminatory manner. National regulatory authorities may lay down conditions for the use of certain prefixes or certain short codes, in particular where these are used for services of general public interest (e.g. freephone services, kiosk billed services, directory services, emergency services), or to ensure equal access.
4. National regulatory authorities shall ensure that the main elements of the national numbering plans, and all subsequent additions or amendments to them, are published in accordance with Article 14 (1), subject only to limitations imposed on the grounds of national security.
5. National regulatory authorities shall encourage the earliest possible introduction of the number portability facility whereby end-users who so request can retain their number(s) on the fixed public telephone network at a specific location independent of the organization providing service, and shall ensure that this facility is available at least in all major centres of population before 1 January 2003. In order to ensure that charges to consumers are reasonable, national regulatory authorities shall ensure that pricing for interconnection related to the provision of this facility is reasonable.
6. National regulatory authorities shall ensure that numbering plans and procedures are applied in a manner that gives fair and equal treatment to all providers of publicly available telecommunications services. In particular, Member States shall ensure that an organization allocated a range of numbers shall avoid undue discrimination in the number sequences used to give access to the services of other telecommunications operators.

#### Article 13 Technical standards

1. Without prejudice to Article 5 (3) of Directive 90/387/EEC whereby the implementation of specified European standards may be made compulsory, national regulatory authorities shall ensure that organizations providing public telecommunications networks or publicly available telecommunications services take full account of standards listed in the Official Journal of the European Communities as being suitable for the purpose of interconnection. In the absence of such standards, national regulatory authorities shall encourage the provision of technical interfaces for interconnection according to the standards or specifications listed below:

- standards adopted by European standardization bodies such as the European Telecommunications Standards Institute (ETSI) or the European Committee for Standardization/European Committee for Electrotechnical Standardization (CEN/CENELEC), or, in the absence of such standards,  
- international standards or recommendations adopted by the International Telecommunications Union (ITU), the International Organization for Standardization (ISO) or the International Electrotechnical Committee (IEC), or, in the absence of such standards,  
- national standards.

2. The Commission may, acting in accordance with the procedure laid down in Article 15, request standards for interconnection and access to be drawn up, where appropriate, by European standardization bodies. Reference to standards for interconnection and access may be published in the Official Journal of the European Communities in accordance with Article 5 of Directive 90/387/EEC.

#### Article 14

##### Publication of and access to information

1. With regard to the information identified in Article 7 (3), Article 9 (2), Article 10 and Article 12 (4), national regulatory authorities shall ensure that up-to-date information is published in an appropriate manner in order to provide easy access to that information for interested parties. Reference shall be made in the national Official Gazette of the Member State concerned to the manner in which this information is published.

2. With regard to the information identified in Article 4 (1), Article 5 (3), Article 5 (5), Article 6 (c) and Article 9 (3), national regulatory authorities shall ensure that up-to-date specific information referred to in those Articles is made available on request to interested parties, free of charge, during normal working hours. Reference shall be made in the national Official Gazette of the Member State concerned to the times and location(s) at which the information is available.

3. Member States shall notify to the Commission before 1 January 1998 - and immediately thereafter in case of any change - the manner in which the information referred to in paragraphs 1 and 2 is made available. The Commission shall regularly publish a corresponding reference to such notifications in the Official Journal of the European Communities.

#### Article 15

##### Advisory Committee procedure

1. The Commission shall be assisted by the committee set up by Article 9 (1) of Directive 90/387/EEC, hereinafter referred to as the 'ONP Committee'.

2. The representative of the Commission shall submit to the committee a draft of the measures to be taken. The committee shall deliver its opinion on the draft, within a time limit which the chairman may lay down according to the urgency of the matter, if necessary by taking a vote.

3. The opinion shall be recorded in the minutes; in addition, each Member State shall have the right to ask to have its position recorded in the minutes. The Commission shall take the utmost account of the opinion delivered by the committee. It shall inform the committee of the manner in which its opinion has been taken into account.

#### Article 16

## Regulatory Committee procedure

1. Notwithstanding the provisions of Article 15, the following procedure shall apply in respect of the matters covered by Article 19.

2. The representative of the Commission shall submit to the committee a draft of the measures to be taken. The committee shall deliver its opinion on the draft within a time limit which the chairman may lay down according to the urgency of the matter. The opinion shall be delivered by the majority laid down in Article 148 (2) of the Treaty in the case of decisions which the Council is required to adopt on a proposal from the Commission. The votes of the representatives of the Member States within the committee shall be weighted in the manner set out in that Article. The chairman shall not vote.

3. The Commission shall adopt the measures envisaged if they are in accordance with the opinion of the committee.

4. If the measures envisaged are not in accordance with the opinion of the committee, or if no opinion is delivered, the Commission shall, without delay, submit to the Council a proposal relating to the measures to be taken. The Council shall act by a qualified majority. If on the expiry of a period of three months from the date of referral to the Council, the Council has not acted, the proposed measures shall be adopted by the Commission.

## Article 17

Procedure for resolving disputes between organizations operating under authorizations provided by different Member States

1. Without prejudice to:  
(a) any action that the Commission or any Member State may take pursuant to the Treaty;  
(b) the rights of the party invoking the procedure in paragraphs 2 and 3, of the organizations concerned or of any other party under applicable national law; the procedure set out in paragraphs 2 and 3 shall be available for the resolution of interconnection disputes between organizations operating under authorizations granted by different Member States, where such dispute does not fall within the responsibility of a single national regulatory authority exercising its power in accordance with Article 9.

2. Any party having a complaint against another organization over interconnection may refer the complaint to the national regulatory authority of the Member State that has granted the authorization of the organization against which the complaint is made. The national regulatory authority shall take steps to resolve the dispute in accordance with the procedures and timescale set out in Article 9 (5).

3. Where there are concurrent disputes between the same two organizations, the national regulatory authorities concerned shall, on request of either party in dispute, coordinate their efforts in order to bring about resolution of the disputes, in accordance with the principles set out in Article 9 (1), within 6 months of referral. The solutions shall represent a fair balance between the legitimate interests of both parties in dispute and be consistent with interconnection rules in the Member States concerned, in conformity with Community law.

## Article 18

Notification

1. Member States shall ensure that national regulatory authorities have the necessary means for carrying out the tasks identified in this Directive, and shall notify to the Commission by 31 January 1997 the national regulatory authorities responsible for those tasks.

2. National regulatory authorities shall notify to the Commission by 31 January 1997, and immediately thereafter in the event of any change, the names of those organizations which:  
- have universal service obligations for the provision of the public telecommunications networks and publicly available telecommunications services set out in Part 1 of Annex I and which are

authorized to collect directly a contribution to the net cost of universal service under the procedure in Article 5 (2),  
- are subject to the provisions of this Directive concerning organizations with significant market power,  
- are covered by Annex II.  
The Commission may request national regulatory authorities to provide their reasons for classifying an organization as having or not having significant market power.

3. The Commission shall publish the names referred to in paragraph 2 in the Official Journal of the European Communities.

#### Article 19

##### Technical adjustment

Modifications necessary to adapt [Annexes](#) IV, V and VII to the Directive to new technological developments or to changes in market and consumer demand shall be determined by the Commission in accordance with the procedure laid down in Article 16.

#### Article 20

##### Deferment

1. Deferment of the obligations under Articles 3 (1), 3 (2), 4 (1), 4 (2), 9 (1) and 9 (3) insofar as those obligations concern direct interconnection between the mobile networks of that Member State and the fixed or mobile networks of other Member States, and under Article 5, shall be granted to those Member States identified in the Council Resolutions of 22 July 1993 and 22 December 1994 which benefit from an additional transition period for the liberalization of telecommunications services for as long as and to the extent that they avail themselves of such transition periods. Member States shall inform the Commission of their intention to make use of them.

2. Deferment of the obligations under Article 12 (5) may be requested where the Member State concerned can prove that they would impose an excessive burden on certain organizations or classes of organization. The Member State shall inform the Commission of the reasons for requesting a deferment, the date by which the requirements can be met, and the measures envisaged in order to meet this deadline. The Commission shall consider the request taking into account the particular situation in that Member State and the need to ensure a coherent regulatory environment at a Community level, and shall inform the Member State whether it deems that the particular situation in that Member State justifies a deferment and, if so, until which date such deferment is justified.

#### Article 21

##### Interconnection with third country organizations

1. Member States may inform the Commission of any general difficulties encountered, de jure or de facto, by Community organizations in interconnecting with organizations in third countries, which have been brought to their attention.

2. Whenever the Commission is informed of the existence of such difficulties, the Commission may, if necessary, submit proposals to the Council for an appropriate mandate for negotiation of comparable rights for Community organizations in these third countries. The Council shall decide by qualified majority.

3. Measures taken pursuant to paragraph 2 shall be without prejudice to the Community's and Member States' obligations under relevant international agreements.

#### Article 22

##### Review

1. The Commission shall report to the European Parliament and to the Council by 31 December 1997, and periodically thereafter, on the availability of rights to interconnect in third countries for the benefit of Community organizations.

2. The Commission shall examine and report periodically to the European Parliament and to the Council on the functioning of this Directive, on the first occasion not later than 31 December 1999. For this purpose, the Commission may request information from the Member States. The report shall examine what provisions of this Directive should be adapted in the light of the developments in the market, the evolution of technology and the changes in user demand, in particular:

(a) for the provisions under Article 5,

(b) to confirm the timetable laid down in Article 12 (5).

The Commission shall also investigate in the report the added value of the setting up of a European Regulatory Authority to carry out those tasks which would prove to be better undertaken at Community level.

#### Article 23

##### Transposition

1. Member States shall bring into force the laws, regulations and administrative provisions necessary to comply with this Directive by 31 December 1997. They shall immediately inform the Commission thereof. When Member States adopt these provisions, these shall contain a reference to this Directive or shall be accompanied by such reference at the time of their official publication. The procedure for such reference shall be adopted by Member States.

2. Member States shall communicate to the Commission the texts of the main provisions of national law which they adopt in the field covered by this Directive.

#### Article 24

##### Entry into force

This Directive shall enter into force on the twentieth day following that of its publication in the Official Journal of the European Communities.

#### Article 25

##### Addressees

This Directive is addressed to the Member States.

Done at Brussels, 30 June 1997.

For the European Parliament

For the Council

The President  
J. M. GIL-ROBLES

The President  
A. NUIS

## ANNEX I

### SPECIFIC PUBLIC TELECOMMUNICATIONS NETWORKS AND PUBLICLY AVAILABLE TELECOMMUNICATIONS SERVICES

(referred to in Article 3 (2))

The following public telecommunications networks and publicly available telecommunications services are considered of major importance at European level. Organizations providing the public telecommunications networks and/or publicly available services identified below which have significant market power are subject to specific obligations with regard to interconnection and access, as specified in Articles 4 (2), 6 and 7.

#### Part 1

The fixed public telephone network

The fixed public telephone network means the public switched telecommunications network which supports the transfer between network termination points at fixed locations of speech and 3,1 kHz bandwidth audio information, to support inter alia:

- voice telephony,
- facsimile Group III communications, in accordance with ITU-T Recommendations in the 'T-series',
- voice band data transmission via modems at a rate of at least 2 400 bit/s, in accordance with

ITU-T Recommendations in the 'V-series'.

Access to the end-user's network termination point is via a number or numbers in the national numbering plan.

The fixed public telephone service according to Directive 95/62/EC of the European Parliament and of the Council of 13 December 1995 on the application of open network provision (ONP) to voice telephony [\(1\)](#).

The fixed public telephone service means the provision to end-users at fixed locations of a service for the originating and receiving of national and international calls, and may include access to emergency (112) services, the provision of operator assistance, directory services, provision of public pay phones, provision of service under special terms and/or provision of special facilities for customers with disabilities or with special social needs.

Access to the end-user is via a number or numbers in the national numbering plan.

#### Part 2

The leased lines service  
Leased lines means the telecommunications facilities which provide for transparent transmission capacity between network termination points, and which do not include on-demand switching (switching functions which the user can control as part of the leased line provision). They may include systems which allow flexible use of the leased line bandwidth, including certain routing and management capabilities.

#### Part 3

Public mobile telephone networks  
A public mobile telephony network is a public telephone network where the network termination points are not at fixed locations.

Public mobile telephone services  
A public mobile telephone service is a telephony service whose provision consists, wholly or partly, in the establishment of radiocommunications to one mobile user, and makes use wholly or partly of a public mobile telephone network.

## **ANNEX II**

### **ORGANIZATIONS WITH RIGHTS AND OBLIGATIONS TO NEGOTIATE INTERCONNECTION WITH EACH OTHER IN ORDER TO ENSURE COMMUNITY-WIDE SERVICES**

(referred to in Article 4 (1))

This Annex covers those organizations which provide switched and unswitched bearer capabilities to users upon which other telecommunications services depend. Organizations in the following categories have both rights and obligations to interconnect with each other, in accordance with Article 4 (1). Interconnection between these organizations is subject to additional supervision by national regulatory authorities, in accordance with Article 9 (2). Special interconnection charges, terms and conditions may exist for these categories of organizations in accordance with Article 7 (3).

1. Organizations which provide fixed and/or mobile public switched telecommunications networks and/or publicly available telecommunications services, and in so doing control the means of access to one or more network termination points identified by one or more unique numbers in the national numbering plan. (See notes below).
2. Organizations which provide leased lines to users' premises.
3. Organizations which are authorized in a Member State to provide international telecommunications circuits between the Community and third countries, for which purpose they have exclusive or special rights.
4. Organizations providing telecommunications services which are permitted in this category to interconnect in accordance with relevant national licensing or authorization schemes.

#### **Notes**

Control of the means of access to a network termination point means the ability to control the telecommunications services available to the end-user at that network termination point and/or the ability to deny other service providers access to the end-user at the network termination point.

Control of the means of access may entail ownership or control of the physical link to the end-user (whether wire or wireless), and/or the ability to change or withdraw the national number or numbers needed to access an end-user's network termination point.



### ANNEX III

#### CALCULATING THE COST OF UNIVERSAL SERVICE OBLIGATIONS FOR VOICE TELEPHONY

(referred to in Article 5 (3))

Universal service obligations refer to those obligations placed upon an organization by a Member State which concern the provision of a network and service throughout a specified geographical area, including - where required - averaged prices in that geographical area for the provision of that service. The cost of universal service obligations shall be calculated as the difference between the net cost for an organization of operating with the universal service obligations and operating without the universal service obligations. This applies whether the network in a particular Member State is fully developed or is still undergoing development and expansion. The calculation shall be based upon the costs attributable to:

- (i) elements of the identified services which can only be provided at a loss or provided under cost conditions falling outside normal commercial standards. This category may include service elements such as access to emergency telephone services, provision of certain public pay telephones, provision of certain services or equipment for disabled people, etc.
- (ii) specific end-users or groups of end-users who, taking into account the cost of providing the specified network and service, the revenue generated and any geographical averaging of prices imposed by the Member State, can only be served at a loss or under cost conditions falling outside normal commercial standards. This category includes those end-users or groups of end-users which would not be served by a commercial operator which did not have an obligation to provide universal service. In peripheral regions with expanding networks, the cost calculation should be based on the additional cost of serving those end-users or groups of end-users which an operator applying the normal commercial principles of a competitive environment would choose not to serve. Revenues shall be taken into account in calculating the net costs. Costs and revenues should be forward-looking.

#### **ANNEX IV**

#### **LIST OF EXAMPLES OF ELEMENTS FOR INTERCONNECTION CHARGES (referred to in Article 7 (3))**

Interconnection charges refer to the actual charges payable by interconnected parties. The tariff structure refers to the broad categories into which interconnection charges are divided,

- charges to cover initial implementation of the physical interconnection, based on the costs of providing the specific interconnection requested (e.g. specific equipment and resources; compatibility testing),
- rental charges to cover the on-going use of equipment and resources (connection maintenance, etc.),
- variable charges for ancillary and supplementary services (e.g. access to directory services; operator assistance; data collection; charging; billing; switch-based and advanced services etc.),
- traffic related charges, for the conveyance of traffic to and from the interconnected network (e.g. the costs of switching and transmission), which may be on a per minute basis, and/or on the basis of additional network capacity required.

Tariff elements refer to the individual prices set for each network component or facility provided to the interconnected party.

Tariffs and charges for interconnection must follow the principles of cost orientation and transparency, in accordance with Article 7 (2).

Interconnection charges may include a fair share, according to the principle of proportionality, of joint and common costs and the costs incurred in providing equal access, and number portability, and the costs of ensuring essential requirements (maintenance of the network integrity; network security in cases of emergency; interoperability of services; and protection of data).

**ANNEX V**  
**COST ACCOUNTING SYSTEMS FOR INTERCONNECTION**  
(referred to in Article 7 (5))

Article 7 (5) calls for details of the cost accounting system; the list below indicates, by way of example, some elements which may be included in such accounting systems. The purpose of publishing this information is to provide transparency in the calculation of interconnection charges, so that other market players are in a position to ascertain that the charges have been fairly and properly calculated. This objective should be taken into account by the national regulatory authority and the organizations affected when determining the level of detail in the information published. The list below indicates the elements to be included in the information published.

1. The cost standard used e.g. fully distributed costs, long-run average incremental costs, marginal costs, stand-alone costs, embedded direct costs, etc. including the cost base(s) used, i.e. historic costs (based on actual expenditure incurred for equipment and systems) or forward-looking costs (based on estimated replacement costs of equipment or systems).

2. The cost elements included in the interconnection tariff  
Identification of all the individual cost components which together make up the interconnection charge, including the profit element.

3. The degrees and methods of cost allocation, in particular the treatment of joint and common costs

Details of the degree to which direct costs are analyzed, and the degree and method by which joint and common costs are included in interconnection charges

4. Accounting conventions  
i.e. the accounting conventions used for the treatment of costs covering:  
- the timescale for depreciation of major categories of fixed asset (e.g. land, buildings, equipment, etc.),  
- the treatment, in terms of revenue versus capital cost, of other major expenditure items (e.g. computer software and systems, research and development, new business development, direct and indirect construction, repairs and maintenance, finance charges, etc.)

The information on cost accounting systems, as identified in this Annex, may be amended in accordance with the procedure referred to in Article 19.

**ANNEX VI**

**THRESHOLDS FOR TELECOMMUNICATIONS TURNOVER**  
(referred to in Article 8 (1) and 8 (2))

Part 1

The threshold for annual turnover in telecommunications activities referred to in Article 8 (1) shall be fifty million ecus. (ECU 50 million)

Part 2

The threshold for annual turnover in telecommunications activities referred to in Article 8 (2) shall be twenty million ecus. (ECU 20 million)

## **ANNEX VII**

### **FRAMEWORK FOR NEGOTIATION OF INTERCONNECTION AGREEMENTS**

(referred to in Article 9 (2))

#### **Part 1**

Areas where the national regulatory authority may set ex ante conditions

- (a) Dispute resolution procedure,
- (b) Requirements for publication/access to interconnection agreements and other periodic publication duties,
- (c) Requirements for the provision of equal access and number portability,
- (d) Requirements to provide facility sharing, including collocation,
- (e) Requirements to ensure the maintenance of essential requirements,
- (f) Requirements for allocation and use of numbering resources (including access to directory services, emergency services and pan-European numbers),
- (g) Requirements concerning the maintenance of end-to-end quality of service,
- (h) Where applicable, determination of the unbundled part of the interconnection charge which represents a contribution to the net cost of universal service obligations.

#### **Part 2**

Other issues, the coverage of which in interconnection agreements is to be encouraged

- (a) Description of interconnection services to be provided,
- (b) Terms of payment, including billing procedures,
- (c) Locations of the points of interconnection,
- (d) Technical standards for interconnection,
- (e) Interoperability tests,
- (f) Measures to comply with essential requirements,
- (g) Intellectual property rights,
- (h) Definition and limitation of liability and indemnity,
- (i) Definition of interconnection charges and their evolution over time,
- (j) Dispute resolution procedure between parties before requesting national regulatory authority intervention,
- (k) Duration and renegotiation of agreements,
- (l) Procedure in the event of alterations being proposed to the network or service offerings of one of the parties,
- (m) Achievement of equal access,
- (n) Provision of facility sharing,
- (o) Access to ancillary, supplementary and advanced services,
- (p) Traffic/network management,
- (q) Maintenance and quality of interconnection services,
- (r) Confidentiality of non-public parts of the agreements,
- (s) Training of staff.

## **ANEXO 2**

Consultation Paper dated September 23, 2002 on tariffs for basic services (including arrangements for Interconnection Usage Charges and Access Deficit Charges)(the “Tariff Consultation”).

<http://www.trai.gov.in/consultation.htm>

Consultation Paper No. 2002/3

**TELECOM REGULATORY AUTHORITY OF INDIA**

**CONSULTATION PAPER**

**ON**

**TARIFFS**

**FOR**

**BASIC SERVICES**

**23<sup>rd</sup> September, 2002, New Delhi**

## PREFACE

1. The rapid technological advance in telecommunications sector has resulted in substantial improvement in availability and accessibility of basic telephony which has significantly helped in the spread of tele-density in the country. A key target of regulatory policy is to promote these objectives of improving access, and tariff policy plays a major role in this regard. Tariff policy aims at protecting consumer interest in a sustainable manner, which involves inter alia, financial viability of the service provider and fostering increased investments for rapid development of the sector. The telecom sector is identified as a high priority area needing swift growth and massive investments. It is felt that competition in the delivery of services can provide the required impetus for a quick growth of this sector.

2. The emerging multi-service multi-operator environment would require a renewed regulatory assessment in the context of both tariff & interconnection issues. All round and sustainable growth in a multi-operator environment would require a streamlined interconnect regime, based on cost based Interconnection Usage Charges (IUC). This becomes all the more critical when competition in the long distance call markets leads to sharp price declines and thus to precipitate larger reduction in the margins available for cross-subsidising the access deficit. The IUC regime provides an important source of revenue to the basic access providers and is a key part of the model Reference Interconnect Offer that has been notified by the TRAI.

3. The last major tariff review was conducted by the Authority in 1998/1999. The present situation has changed substantially and a new review is called for. This consultation paper seeks to explore the tariff framework for basic service, including dial-up access to Internet services, in the context of the competitive trends seen in the telecom market. The outcome expected in the Consultation Paper is two fold. One, the Authority would like to elicit a feedback on the key objectives to be served by this tariff review. Two, to determine the regulatory direction for a medium term scenario. Thus the questions posed are set in the context of trends seen to be emerging in the market for basic services.



4. This consultation paper concentrates on certain key principles relating to regulation of tariff for basic services. Chapter 2 of the Consultation paper examines the evolving structure of the basic service market with an analysis of the degree of competition that is likely to arise in the near future, the changes in tariffs for basic services in the past few years including the substantial changes that have taken place due to the introduction of competition in the NLD and ILD markets. Certain key questions on the regulatory framework for tariffs are raised in this background. Chapter 3 of the Consultation Paper addresses the details regarding basic tariff review with respect to monthly rentals and call charges. Chapter 4 deals with a short exposition on the tariffs for dial up access to internet. The Authority is of the view that it is important to consider these tariffs if a faster spread of internet is to be encouraged. Chapter 5 provides details on the Interconnection Usage Charge (IUC) regime for National Long Distance Calls. This chapter gives estimates prepared by the TRAI for origination, termination and carriage charges for NLD traffic, which is intended to be used as the basis for discussion on this issue.

5. The Authority invites written responses from all stakeholders latest by closing hours of 25<sup>th</sup> October, 2002. It would be appreciated if the response is accompanied by a Floppy Diskette or Email having the contents of the submission.

6. For further clarifications, Dr.(Mrs) Roopa R.Joshi, Advisor (Economic) – Tel. No. 6160752. Email address: [traï01@bol.net.in](mailto:traï01@bol.net.in) and Shri R.K.Bhatnagar, Advisor (FN) – Tel. No. 6166930 Email address: [traï06@bol.net.in](mailto:traï06@bol.net.in) may be contacted. The Fax no. of TRAI is 6103294.

New Delhi  
23 September, 2002

M.S.Verma  
Chairman

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## **GLOSSARY**

ADC	Access Deficit Charge
ARE	Average Recurring Expenditure
ARPU	Average Revenue Per User
BSNL	Bharat Sanchar Nigam Ltd.
BSO	Basic Service Operator
BT	British Telecom
CPE	Customer Premises Equipment
CPI	Consumer Price Index
DEL	Direct Exchange Line
DIAS	Direct Internet Access System
DID	Direct Inward Dialing
DSL	Digital Subscriber Line
FRIACO	Flat Rate Internet Access Call Origination
ILALD	Internet Lease Access Line Doubler
ILD	International Long Distance
ISDN	Integrated Services Digital Network
ISP	Internet Service Provider
ITU	International Telecom Union
IUC	Interconnection Usage Charges
LE	Local Exchange
MOU	Minutes of Use
MTNL	Mahanagar Telephone Nigam Ltd.

NLD	National Long Distance
NTP	National Telecom Policy
OFC	Optical Fiber Cable
OFTEL	Office of Telecommunications (UK)
PABX	Private Automatic Branch Exchange
PCO	Public Call Offices
PLMN	Public Land Mobile Network
POTS	Plain Old Telephone Service
PSTN	Public Switched Telecom Network
RIO	Reference Interconnection Offer
SDCC	Short Distance Charging Centre
STD	Subscriber Trunk Dialing
STP	Standard Tariff Package
TAX	Tandum Automatic Exchange
TDSAT	Telecom Dispute Settlement Appellate Tribunal
TRAI	Telecom Regulatory Authority of India
TTO	Telecommunication Tariff Order
USF	Universal Service Fund
USO	Universal Service Obligation
VPT	Village Public Telephone
WLL(M)	Wireless in Local Loop (with Limited Mobility)

## **I. INTRODUCTION**

- 1.1 It is well recognized that the availability of affordable basic telephony on demand is essential for meeting the tele-density targets set in NTP 1999 (National Telecom Policy). Given that telecommunications is an important contributor to economic growth, recent developments, particularly that of rapid technological progress have changed the pace of expansion and more importantly made basic services less costly to provide because of falling costs of network elements. On the supply side, traditional models of a monopoly service provider providing telephony is giving way to a multi-operator environment - wherein new entrants also provide the added investment and spur efficiency gains in the provision of services.
- 1.2 The main objective of this consultation paper is to examine in depth, the nature, content and direction of tariff regulation with respect to basic services. The paper seeks to explore the right framework for basic services tariff regulation in the context of competitive trends seen in the basic telephony market.
- 1.3 Some of the key principles relating to the regulation of tariff for basic services being focussed in the consultation paper are listed below:-
- Promoting access to basic telecommunication services, particularly in rural and remote areas by making them affordable.
  - Creating enabling conditions to promote competition.
  - Prevent abuse of market power and anti-competitive behaviour of service providers, who enjoy significant market power.
  - Increase tele density to meet the targets of NTP 1999, by making basic services affordable.
  - Ensure transparency in regulatory processes.

- 1.4 The consultation paper is structured as follows:-
- 1.5 Chapter two examines the structure of the basic service market with an analysis of the degree of competition that is likely to arise in the near future. The Chapter summarises the evolution of the market structure and tariffs for basic services in the past few years, noting the process of tariff re-balancing that was begun by the TRAI with its notification of the Telecommunication Tariff Order (TTO) 1999 and the substantial changes that have taken place due to market competition in the National Long Distance (“NLD”) and International Long Distance (“ILD”) markets.
- 1.6 Chapter three addresses the issue of telecom tariffs in greater detail, and raises a number of questions for consultations with respect to monthly rentals, call charge, free calls, etc. The objective of the Chapter is to consider the main issues relating to the regulation of tariffs for basic service, including the methodology and principles applicable to such regulation. Some examples of tariff schemes have been given to help initiation of discussions. The tariff schemes that have been mentioned in the Chapter should not be treated as any indication of the TRAI’s thinking on the subject. This Chapter also provides a basis for considering introduction of origination/termination charges applicable to local calls.
- 1.7 Chapter four is a short exposition on tariffs for dial up access to internet. This is an area which has been the subject of the Authority’s concern for some time now. In the recent times there have also been many representations about their being very user unfriendly and actually a deterrent to the growth of internet usage in the country. A Task Force set up by the TRAI to provide inputs for promoting the growth of the internet sector has also identified it as one of the factors responsible for the slow growth of internet in the country.

1.8 Chapter five outlines a framework for introducing the Interconnection Usage Charge (IUC) regime for National Long Distance Calls. The Chapter provides the estimates for origination, termination and carriage charges for NLD traffic, based on a detailed exercise undertaken by the TRAI. The estimates have been arrived at after examining the IUC charges based on different costing methodologies (top down, bottom up, and outside in) and also taking into account some international benchmarks in this regard. These would be relevant for the negotiations in respect of IUC within the framework of the Reference Interconnect Offer that is required to be notified by the dominant operators. In this context, the Authority also raises the issue whether for the IUC there should be a range given by the regulator or voluntarily agreed upon by all the parties concerned. It also invites comments on the estimates that have been given in this paper.

## **II. COMPETITIVE TRENDS IN BASIC SERVICES- AN ANALYSIS OF EMERGING TRENDS**

### **(a) Tariff Changes since notification of TTO in March 1999**

- 2.1 In this section, we consider the market driven tariff changes for Basic Services that have occurred since the implementation of the Telecommunication Tariff Order (TTO) 1999. The focus is on monthly rentals and local call charges. In this context it is worth emphasising that National Long Distance (NLD) and International Long Distance (ILD) have recently emerged as stand alone services and are offered competitively by independent private operators holding specific licenses for offering these services. When the last exercise was done in 1998/99, the Department of Telecom (DOT) was operating a vertically integrated network offering bundled local and long distance service in a monopolistic market structure.
- 2.2 The TTO 1999 had begun a process of tariff re-balancing with an increase in monthly rentals and decrease in NLD and ILD tariffs i.e., to bring them near the cost. The change in monthly rentals, and tariffs for NLD and ILD calls were implemented by TTO 1999 in three steps, so as to phase-in the sizeable revisions in these tariffs. However, it is noteworthy that at present the prevailing NLD and ILD tariffs are much below the levels envisaged in TTO 1999; while the NLD tariffs are below the TTO specified levels by up to 62 per cent, the ILD tariffs are lower by up to 50 per cent.
- 2.3 The large decline in the NLD and ILD tariffs witnessed in recent years has more than achieved the reductions envisaged in TTO, 1999 as part of the tariff rebalancing exercise. However, rebalancing which also envisages a corresponding increase in rentals to bring them near cost has not taken place. The Regulator has maintained the initial levels of rentals specified in TTO 1999 for the non-commercial subscribers, on account of considerations of affordability and increasing teledensity in the country. The Authority did, however, increase the monthly rentals for the commercial subscribers this year as a part of re balancing of tariff, but these higher rentals for commercial subscribers were not made



effective by the service providers partly because of apprehensions that the competitors may not act similarly and partly for fear of encountering consumer resistance and diversion of his business.

- 2.4 While there is no denying that rebalancing of tariffs prepares the grounds for competition, the adverse impact it is likely to have on affordability by ordinary/general subscribers cannot be overlooked. In the final analysis the tariff structure has to sustain demand and help achieve higher tele density by making basic telephone service affordable. In view of this, TTO 1999 permits Alternative Tariff Packages (ATP) in addition to the mandatory Standard Tariff Package (STP). The mandatory STP protects the interest of subscribers, while ATPs allows operators to compete for the subscriber's differentiated needs, thereby ensuring that the benefits of competition are available to the subscribers, in the form of lower prices and/or better quality.

**(b) Number and Nature of Alternative Tariff Packages in Basic Service**

- 2.5 For the period January, 2001 to December, 2001, the number of tariff plans reported were around 282 (including by BSNL and MTNL). Since the beginning of this year until mid July i.e. in 7 months of 2002 for which up to date information is available, the total number of tariff reports received is 283 (private BSO 256, BSNL 20, MTNL 6) for the various services they are providing under the basic service licence. These include PSTN, PCO, ISDN, EPABX service etc. Important features of the ATPs reported by the BSOs for provision of PSTN services are the following:-

- i) The BSOs generally offer ATPs that have higher monthly rentals with higher free call allowance or low rental and no free call allowance. In addition, volume discounts are a popular method of offering lower effective prices to subscribers of Basic Services. Promotional packages are also offered by most of the BSOs. Such offers include free Internet access, free calls, Free CLIP, free Voice Mail, rebate in rentals, discount in installation fee and registration fee etc.

ii) A feature worth noting is that between the period March 1999 and January 2001, the number of ATPs reported by BSOs were limited. Since opening up of the NLD and ILD markets, issue of fresh licenses to BSOs and entry of the fourth cellular player in certain service areas has had the effect of increasing the level of competition for Basic Services as manifested in an increase in the number, frequency and variety of alternative tariff plan filings by operators.

(c) **Price Changes for Basic Services**

2.6 Such alternative tariff packages available along with the STP prescribed by TRAI imply that the effective tariff for subscribers is different from the level specified by TRAI in the STP. In order to calculate the changes in tariffs over the period of operation of TTD 1999 until the present, one will have to look at the usage pattern i.e. break up of calls over local, long distance and International long distance. Such information is not readily available, although based on such figures as are available, some assumptions can be made. In the absence of precise information, and an estimate of demand elasticity, it is possible to make a tentative estimate of price decline of basic services from the changing ARPUs over the period.

2.7 Table 2.1 shows Average Revenue Per User (ARPU) per year for BSOs. The projections are based on the information provided to TRAI by the operators. The trend that emerges from the table is that ARPUs have declined for each BSO and are expected to continue to decline in the medium term. The reason for the decline in ARPUs is a mixture of both fall in tariffs as well as competition for acquiring subscribers who are likely to be the lower users.

**Table 2.1 Current and Projected Annual ARPUs of different BSOs (Rs./annum)**

<b>Operator</b>	<b>1998-99</b>	<b>1999-00</b>	<b>2000-01</b>	<b>2001-02</b>	<b>2002-03</b>	<b>2003-04</b>
A	8,278	7,061	5,948			
B	40,198	15,691	15,727	17,105	16,553	16,761
C	-	-	17,564	20,168	17,991	16,273
D	-	84,052	52,658	35,813	33,994	31,041
E	-	-			15,994	14,750
F	-	-	22,604	17,730	17,088	12,470
G	-	30,822	30,030	19,575	16,404	16,060

Source: Reports from BSO's

2.8 Tariff reports submitted by service providers were also examined to gauge the extent of tariff changes in the alternative tariff packages. Table 2.2 present data for the period 2000-2001. The methodology used for determining the trends in tariffs for basic service over the period 2000 to 2001 consisted of taking alternate tariff plans offered by the basic operator during the two points of time i.e in the year 2000 and year 2001 from which financial implications (Minimum monthly bill amount) for minutes of use ranging from 100 to 1000 per month were computed. This exercise was repeated for various basic service operators in different circles/cities. As stated above, the intensity of price competition during this period for Basic Services was low and the figures reflect this aspect of the market. For example, while in certain Circles there was no change in tariffs in the last year, in another Circle the average tariffs declined by 3 per cent to 10 per cent depending upon usage. On the other hand, in one Circle, there was an increase in average tariffs, with a higher burden falling on low users. Besides the lack of effective competition in the market during this period, one could also presume a tendency amongst the new private operators to focus, in the first few years of operation, less on market share and more on attracting the high-end users.

**Table 2.2 Estimate of Price Changes for different categories of subscribers (2000 – 2001)**

Service Providers in Various Circles	No. of Minutes of usage					
	100	200	300	400	500	1000
A	17%	13%	10%	7%	6%	3%
B	35%	25%	18%	15%	12%	6%
C	0%	0%	0%	0%	0%	0%
D	0%	0%	0%	0%	0%	0%
E	100%	53%	28%	18%	13%	5%
F	-7%	-7%	-5%	-4%	-6%	-3%
G	-7%	-10%	-8%	-7%	-6%	-3%

Source: Computed from Tariff plans reported by service providers

**(d) Subscriber base - Market Share of different Service Providers**

2.9 The share of BSNL and MTNL in basic services continues to be over 98% of the total market. Private provision of basic services has so far been able to create only a very limited impact accounting for no more than 1.6% of the total market. There could be several reasons for this. The first private operator to begin commercial services was Bharti Telenet in Madhya Pradesh Circle in June 1998 followed by Hughes Telecom in Maharashtra about four months later. In all six private basic operators have started commercial services and it has been only slightly over four years since the start of the first private basic operation. Four years is too small a time to make any serious dent in the market monopolised by a Government owned operator who for several decades has dominated the markets. Table 2.3 shows the extent of subscriber coverage, past and present as well as projections for the future. These are on the basis of inputs received by the TRAI from the Service Providers.

**Table 2.3 Market Share of Basic Service Operators**

	1998-99	1999-00	2000-01	2001-02
BSNL	82.99%	84.32%	85.95%	86.43%
MTNL	16.92%	15.12%	13.23%	12.05%
A	0.06%	0.35%	0.35%	0.47%
B	0.03%	0.08%	0.21%	0.42%
C		0.10%	0.18%	0.39%
D			0%	0%
E			0.03%	0.07%
F		0.03%	0.04%	0.17%

Source: Based on DEL's reported by BSO's to TRAI.

**Table 2.4 Current and Projected Subscriber Base for Basic Services**

		1998-99	1999-00	2000-01	2001-02	2002-03 (projected)	2003-04 (projected)
<b><u>Incumbents</u></b>							
BSNL	Opg	14,394,956	17,939,773	22,479,721	28,108,976	N.A	N.A
	Clg	17,939,773	22,479,721	28,108,976	33,218,498	N.A	N.A
MTNL	Opg	3,406,740	3,653,913	4,031,624	4,327,158	N.A	N.A
	Clg	3,653,913	4,031,624	4,327,158	4,629,709	N.A	N.A
<b><u>New Entrants</u></b>							
A	Opg	-	13,980	91,967	115,212	165,000	210,000
	Clg	13,980	91,967	115,212	165,000	210,000	260,000
B	Opg	-	-	-	13,705	77,333	158,199
	Clg	-	-	13,705	77,333	158,199	246,647
C	Opg	-	5,717	22,913	69,599	150,000	220,665
	Clg	5,717	22,913	69,599	150,000	220,665	300,914
D	Opg	-	-	4	109	140	360,000
	Clg	-	4	109	140	360,000	600,000
E	Opg	-	-	-	9,119	29,575	87,000
	Clg	-	-	9,119	29,575	87,000	180,000
F	Opg	-	285	26,744	58,709	150,797	302,638
	Clg	285	26,744	58,709	150,797	302,638	450,286

Source: Data provided by service providers (Opg : Opening) (Clg : Closing)

- 2.10 The projections available from the new entrants (i.e. the private sector operators) in Tables 2.4 indicate that BSNL and MTNL will remain the dominant operators in terms of market share in the near future and will continue to be so for some time to come.
- 2.11 Market trends given in pre-para indicate that as far as basic services are concerned, there is no likelihood of effective competition in the medium term, necessitating regulatory intervention to fix tariff in the absence of market forces. Regulatory intervention is also required to meet the social objective of making basic telephony affordable. This is in line with trends witnessed in most developing countries as well as a large number of developed countries.
- 2.12 While this conclusion could be valid, an analysis of only the basic services market and the shares of different Basic Services Operators (BSOs) therein could be misleading as it would ignore possible competition from the other access providers i.e. cellular operators. To the extent that these two access services are substitutable, an expansion of the definition of the market to include both basic and cellular services could provide insights into nature and extent of competition that are different from those that can be had by treating the two i.e. basic and cellular markets, as independent.

(e) **Level of Competition in Long Distance Segment of Basic Service**

i) **NLD Service**

- 2.13 With the opening up of the market for long distance i.e. NLD and ILD (by the entry of players other than the incumbent) the monopolistic nature of the long distance market is likely to evolve towards a multipolistic market structure sooner than later. In this change, cellular mobile services and their fast growth will have an important role as this will affect competition in the telecom market. However, taking note of the fact that at present the private NLD operator has established POPs in only 18 LDCAs out of 321 and is in a position to pick up traffic from less than 10% of the SDCAs, the conclusion that the incumbent will continue to dictate NLD tariff for quite some time, is inescapable.

2.14 The TRAI in its 20<sup>th</sup> Amendment to TTO 1999 provided for implementation of the third tranche of rebalanced tariff levels for National long distance traffic. However, as already mentioned earlier, current levels of NLD tariffs announced by the NLD operators are up to 62% below the TRAI prescribed, rebalanced levels. Table 2.5 below provides a snapshot of the TRAI determined pulse and call charge per minute and the existing call charges as announced by the incumbent operator.

**Table 2.5 Comparison Between NLD Tariff Ceilings Specified By TRAI and the NLD Tariffs Implemented By BSNL**

	TRAI (TTO 20 <sup>th</sup> Amendment)		Tariff Given By NLD Operators	
	Existing Pulse (Seconds)	Existing call charge per min. (Rs.)	Existing Pulse (Seconds)	Existing call charge per min. (Rs.)
Local calls	180	0.40	180	0.40
NLD				
0 to 50 Kms	180	0.40	180	0.40
51 to 200 Kms	18	4.80	30	2.40
201 to 500 Kms	6.8	10.80	15	4.80
501 to 1000 Kms	4.6	16.80	8	9.60
Above 1000 Kms	3.5	21.60	8	9.60

Note: A call of 3 minutes duration has been taken for local calls and for the NLD call for distance “0 to 50 kms.”

**ii) ILD Service**

2.15 Competitive trends witnessed in the ILD market is much more pronounced than in the NLD market, because of the recent entry of two new operators in addition to the incumbent VSNL, namely Data Access and Bharti Telesonic. Table 2.6 provides the differentials between the ILD tariffs as set in the third tranche of rebalancing and the competitive rates offered by the operators.

**Table 2.6 Peak Hour Pulse Duration/Ceiling Tariff Specified By TRAI and the Tariffs Offered in The Market By the ILD Operators (tariff calculated at Rs.1.20 per metered call)**

Country Categories	TRAI (20 <sup>th</sup> Amendment) (Third Tranche Ceiling Tariff)		VSNL/Data Access/BTSOL ( Reported/ existing)	
	Pulse Rate (Seconds)	Per minute Charge (Rs.)	Pulse Rate (Seconds)	Per minute Charge (Rs.)
SAARC & other Neighboring Countries	3.3	21.60	3.4	21.60 (18.00)
Africa, Europe, Gulf & Oceania	2.3	32.40	3.0	24.00 (21.60)
Countries in American Continent and other places in Western Hemisphere	1.8	40.80	3.0	24.00 (21.60)

Note: The figures in the parentheses show the off peak tariff. TRAI did not specify any off-peak tariff, i.e. it had forborne with respect to those tariffs.

2.16 An important factor which could put downward pressure on ILD tariffs is the emergence of IP telephony. A comparison of IP telephony rates per minute (range) with existing landline ILD tariffs is shown in the Table given as Annex-I. It is observed and interestingly so, that the most competitive tariffs are to the European, Australian and North American continents.

2.17 Evidence from the above sections would suggest that while the market for access is heavily skewed towards the incumbent and is likely to remain so in the near and mid-term, the trends are different in both the NLD and ILD segments. In these segments competition would be more vibrant, and this would need to be factored in for regulatory policy formulations.



(f) **TTO 1999, its background and Changes since its introduction**

2.18 Tariff regulation is seen as a key regulatory tool to protect consumer interest and to give cost orientation to basic service tariffs when this is not being done through effective market competition. Tariff provisions contained in TTO 1999 need to be seen in the background of the level of competition in basic services then obtaining and growth of competition since then. In the absence of effective competition regulatory intervention in basic services tariff will continue to be important and for some time more remain one of the major functions of the Authority. At the time TTO 1999 was brought into force teledensity was very low and affordability and social objectives of accessibility had to be kept in focus together with the need to encourage investment and efficient roll out of networks. Historically, the local call charges and rentals had been kept below cost in the interest of affordability and were cross subsidized by cost plus long distance charges. It is difficult to alter a tariff structure based on above considerations all of a sudden. However, with such a tariff structure, a small subscriber base provides majority of the revenue, and if competition is allowed the new entrant would initially focus mainly on this small base of subscribers who account for high revenue. This makes it difficult for the incumbent to sustain its revenue surplus and the subscriber base. To mitigate the burden of adjustment on the incumbent and to maintain a level playing field for all service providers, there is a need to rebalance tariffs for the basic services i.e. to increase rental/local call charges and decrease long distance call charges. This need was felt and given effect through TTO 1999. The proposed extent of rebalancing was spread over three years in corresponding three phases which have since been completed.

2.19 Based on extensive consultations in 1998, with the objective of achieving some rebalancing between access and long distance call charges the TRAI notified charges for the following elements of basic service tariff in its TTO 1999: Installation, Deposits, Monthly rentals for rural subscribers, Monthly rentals for urban subscribers, Tariff per metered call for rural subscribers, Free calls for rural

subscribers, Tariff per metered call for urban subscribers, Free calls for urban subscribers, Pulse rate for local calls, Pulse rates for peak hours for domestic long distance calls, Pulse rates for peak hours for international subscriber dialed calls, Peak hour tariff for trunk manual calls, Franchised group PBX or PABX and EPABX with DID facility (for multistory buildings, co-operative housing societies), and Tariffs for ISDN services.

2.20 Since its notification, the TTO, 1999 has been amended with respect to the areas shown in Annex-II. These amendments were made either to correct some anomalies which were observed in the course of implementation of the TTO 1999 or arose from changes in the market situation including changes in the cost structure of service provision.

2.21 In this consultation, we are addressing the tariff categories which are covered under Schedule I of TTO 1999. These include, inter alia, monthly rentals, call charges for local calls, long distance calls, and international calls, charges for end-users of DID exchange, call charges for dial-up for internet, and free calls. In addition, competition issues in other relevant markets, wherever applicable will be addressed.

**(g) Tariff Rebalancing in TTO, 1999**

2.22 Tables 2.7 to 2.12 show the extent of change in Tariffs that was envisaged in the TTO 1999 in the Standard Tariff Package over the three years of operation of TTO 1999 from May 1999 to March 2002. As is evident from the Tables the proposed extent of tariff rebalancing, in particular the increase in monthly rental, envisaged in TTO 1999 was more than the tariff changes that were actually implemented.

2.23 In contrast, for National Long Distance (NLD) and International Long Distance (ILD), the decrease in tariff envisaged for the third phase lost relevance because apprehensions of loss of market spurred the incumbent to drop these rates substantially below the rebalanced levels proposed in TTO 1999 .

2.24 In order to culminate the process of rebalancing in its targeted penultimate year, the Authority, while taking note of the competitive trends in the NLD and ILD markets decided to notify the third tranche of STD tariffs for NLD and ILD tariffs as ceilings in the 20<sup>th</sup> Amendment to the TTO 1999. The monthly rentals were kept unchanged for low user category and general user category (which were combined into a single category of non commercial user subscriber). However, for commercial subscribers, the rentals were increased as specified in the third tranche of rebalancing and the number of applicable free calls reduced to 30 and 45 metered calls per month of billing cycle for urban and rural commercial subscriber respectively.

2.25 It would be observed that in respect of monthly rentals the extent of re-balancing achieved in the STP has been less than envisaged, although the extent of tariff decline for NLD and ILD tariffs has been significantly more than that specified under the TTO 1999.

**Table 2.7: Monthly Rental for Basic Services for Rural Areas – Low User**

Item	Rates before the re-balancing prior to 1.5.1999 (Rs.)	Rates according to Telecom Order 1999		Cumulative increase envisaged in TTO from 1-5-99 to 31-3-02	% increase not implemented by virtue of 9 <sup>th</sup> Amendment to TTO 1999
		Rates for the final phase of rebalancing	% rise		
Rentals (for exchanges with capacity up to 999 lines)	50	70	40%	40%	0%
1,000 to 29,999 lines	100	120	20%	20%	0%
30,000 to 99,000 lines	137.5	180	31%	31%	0%
1 lakhs to below 3 lakhs lines	180	250	39%	39%	0%
3 lakhs and above	190	250	32%	32%	0%

**Table 2.8 : Monthly Rental for Basic Services for Rural Areas – General User**

Item	Rates before the re-balancing prior to 1.5.1999 (Rs.)	Rates according to Telecom Tariff Order 1999		Cumulative increase envisaged in TTO from 1-5-99 to 31-3-02	% increase not implemented by virtue of 9 <sup>th</sup> Amendment to TTO 1999
		Rates for the final phase of rebalancing	% rise cumulative		
1,000 to 29,999 lines	100	160	60%	<b>60%</b>	<b>40%</b>
30,000 to 99,000 lines	137.5	220	60%	<b>60%</b>	<b>29%</b>
1 lakhs to below 3 lakhs lines	180	310	72%	<b>72%</b>	<b>33%</b>
3 lakhs and above	190	310	63%	<b>63%</b>	<b>32%</b>

**Table 2.9 : Monthly Rental for Basic Services for Urban Areas – Low User**

Item	Rates before the re-balancing prior to 1.5.1999 (Rs.)	Rates according to Telecom Tariff Order 1999		Cumulative increase envisaged in TTO from 1-5-99 to 31-3-02	% increase not implemented by virtue of 9 <sup>th</sup> Amendment to TTO 1999
		Rates for the final phase of rebalancing	% rise cumulative		
Rentals (for exchange with capacity of less than 100 lines)	50	120	140%	<b>140%</b>	<b>0%</b>
Upto 999 lines	75	120	60%	<b>60%</b>	<b>0%</b>
1,000 to 29,999 lines	100	120	20%	<b>20%</b>	<b>0%</b>
30,000 to 99,000 lines	137.5	180	31%	<b>31%</b>	<b>0%</b>
1 lakhs to below 3 lakhs lines	180	250	39%	<b>39%</b>	<b>0%</b>
3 lakhs and above	190	250	32%	<b>32%</b>	<b>0%</b>

**Table 2.10 : Monthly Rental for Basic Services for Urban Areas – General User**

Item	Rates before the re-balancing prior to 1.5.1999 (Rs.)	Rates according to Telecom Tariff Order 1999		Cumulative increase envisaged in TTO from 1-5-99 to 31-3-02	% increase not implemented by virtue of 9 <sup>th</sup> Amendment to TTO 1999
		Rates for the final phase of rebalancing	% rise cumulative		
Rentals (for exchange with capacity of less than 100 lines)	50	160	220%	220%	80%
Upto 999 lines	75	160	113%	113%	53%
1,000 to 29,999 lines	100	160	60%	60%	40%
30,000 to 99,000 lines	137.5	220	60%	60%	29%
1 lakhs to below 3 lakhs lines	180	310	72%	72%	33%
3 lakhs and above	190	310	63%	63%	32%

Note: The monthly rentals for the commercial subscriber category was the level that was the rate in the third year for the general user subscriber category. This rental was implemented only in the third phase of the tariff re-balancing.

**Table 2.11 : Peak Charge for Domestic Long Distance Calls**

DLD radial distance in kms	Rates before the re-balancing prior to 1.5.1999	Rates according to Telecom Tariff Order 1999 (Rs.; at Rs. 1.20 per pulse)		Cumulative decrease envisaged in TTO from 1-5-99 to 31-3-02	% decrease not implemented by virtue of 9 <sup>th</sup> Amendment to TTO 1999
	Charge per minute in prevailing scheme at Rs. 1.25 per pulse	Rates for the final phase of rebalancing	% fall cumulative		
Upto 50	2.08	1.2	42.3%	42%	0%
51-200	9.58	4.8	49.9%	50%	13%
201-500	18.75	10.8	42.4%	42%	6%
501-1000	25	16.8	32.8%	33%	5%
Above 1000	37.5	21.6	42.4%	42%	10%

**Table 2.12 : Peak Charge for International Long Distance Calls**

ILD Country Categor-ies	Rates before the re-balancing prior to 1.5.1999	Rates according to Telecom Tariff Order 1999 (Rs.; at Rs. 1.20 per pulse		Cumulative decrease envisaged in TTO from 1-5-99 to 31-3-02	% decrease not implemented by virtue of 9 <sup>th</sup> Amendment to TTO 1999
	Charge per minute in prevailing scheme at Rs. 1.25 per pulse	Rates for the final phase of rebalancing	% fall cumulative		
Slab 1	37.5	21.6	42.4%	42%	10%
Slab II	62.5	32.4	48.2%	48%	13%
Slab III	75	40.8	45.6%	46%	11%

2.26 It is pertinent to mention here that while re-balancing did allow for a recalibration of commercial users rentals, none of the service providers have raised these rentals. The Service Providers thus have not re-balanced this element although they had an opportunity to do so and thereby foregone some much needed resources which could have been used to cover, at least, a part of the otherwise high access deficit.

**(h) Context of Tariff Rebalancing Today**

2.27 The ultimate objective of tariff rebalancing would be to make the access deficit zero by raising the rental/local call charges to their cost based levels. However, when we look at the present teledensity and universal service objectives clearly the stage for complete rebalancing has not yet arrived. Once it is conceded that access deficit has to be provided the question of the source from which the deficit can be met assumes importance. Much, therefore, depends on the flexibilities available in the existing set of tariffs, i.e. those relating to NLD and ILD sectors, to allow for rebalancing. The current consultation paper would need to factor in the changed competitive conditions as well as the feasibility and desirability of using IUC as a means to address the issue of access deficit.

(i) **Rate of return and price cap regulation**

- 2.28 Regulators have broadly used two types of methodologies to regulate tariffs, namely rate of return regulation and price cap methodology. Under a rate of return methodology, the cost allocated to any specific service/tariff is estimated and the tariff is fixed by providing a reasonable return on the cost base. The objective is thus to address the concerns of both the consumers and the producers. This method also provides for greater certainty of prices, which is important for investment decisions. However, with this methodology, over a period of time, there was an incentive for the service providers to over-estimate their costs or even over-dimension their facilities. Methods were sought to address this problem.
- 2.29 One method to address this would be to monitor closely the cost developments and have benchmarks for the costs concerned, reviewing periodically the costs and the tariffs. Another would be to alter the incentive for cost over-estimation by allowing the service providers themselves to choose the tariffs for various services, subject to certain overall constraints. Such an incentive structure is attempted through the price cap methodology.
- 2.30 Under the price cap methodology, a general cap or limit on the overall price increase is put by specifying that the overall average tariffs/prices of the basket of services (e.g. monthly rental, local call, national long distance calls) should not increase by more than the net increase in costs. The proxy for a net increase in costs is usually captured by “CPI minus X”, i.e. change in the consumer price index minus a factor which captures the reduction in costs due to improvement in productivity. In addition to the overall cap of CPI minus X, this methodology also allows for specific caps for sub-baskets, e.g. a sub-basket of monthly rental with the cap that this tariff should not increase by more than a specified per cent per annum.

**(j) Conclusion : Inferences for Regulatory Policy**

- 2.31 Based on the analyses of basic service market, it would appear that so far the competition in the local service market has remained insignificant with only a duopoly in 6 telecom circles. However, competitive pressure appears to be more pronounced in the NLD and ILD market, where more than two operators have recently entered the market and are likely to offer significant competition to the incumbent. The extent of competition for basic services may change somewhat with the growth of Wireless in Local Loop with limited mobility (hereinafter “WLL(M)”). Nonetheless, the likely trends continue to show a major dominance of the incumbents for the next few years. Moreover, the teledensity of the country is still low, and the objective of affordability will continue to be of great importance in any regulatory policy regarding telecom tariffs. For both these reasons, it appears that there will continue to be a need to regulate Basic Service tariffs for some more time and that complete rebalancing of PSTN tariff i.e. introduction of cost based rates for both local and long distance services can be achieved only in phases. In the interim, the charges payable for long distance origination and termination may have to provide for what may be called ‘Access Deficit Charge’ (ADC), which in effect will be a means to subsidize the below cost tariffs, i.e. rental/local call charges.
- 2.32 To the extent that tariff regulation is required, the exact methodology will remain a critical issue i.e. how best to regulate these tariffs. For example, the regulator will have to consider whether to continue with the specification of tariff levels or a price cap or whether any other methodology be used. Issues regarding asymmetric regulation and whether specific services e.g. certain types of calls (domestic/international long distance) could be subject to different regulatory policies would also assume importance with the changing conditions in the market and merit consideration.



**2.33 Based on the discussions of the main issues of basic services tariff regulation, the consultation seeks to address the following issues:**

- 1) In view of the existing market structure wherein the incumbent has more than 98% of the market share in the access market and almost the same in the local and long distance services, what would be the immediate objectives of regulations, particularly tariff regulation? Is the need for rebalancing between NLD/ILD tariffs and access tariffs as critical today after introduction of competition in all these areas, as it was when it was first undertaken through TTO 1999? Should efforts to rebalance tariff through regulatory intervention continue?**
- 2) Has market development reached a stage to warrant a different modality of tariff rebalancing namely a shift from a regulator driven regulation? If the answer to the above question is in the positive, what should be the new pattern of tariff regulation:-**
  - (i) An overall price cap, with or without sub-caps for specified services (please indicate the service to be specified); or only a floor price to be specified for all specified services; or a combination of both ceiling and floor prices; or**
  - (ii) Should a system be followed wherein only some specified services such as local services are regulated?**
- 3) With the opening up of NLD and ILD to new players should there be a schedule for these tariffs separate from the basic services tariff schedule?**
- 4) Should we continue with the present method of specifying a mandatory standard tariff package, and allowing the service provider to offer alternative tariff packages?**
- 5) Does a ground exist for applying asymmetric regulation i.e. regulation applying only to the incumbent who enjoys significant market power and has the ability to control prices?**
- 6) Should specific services (e.g. domestic/international long distance) be subject to different regulatory policies, than the local services?**

### **III. FRAMEWORK AND METHODOLOGY FOR BASIC TARIFF REVIEW**

- 3.1 One of the principal objectives of tariff rebalancing exercise for basic services is to promote efficiency in the supply of telecommunication services and at the same time provide basic telephone service (POTS) at affordable prices, to the consumers. While the former is dictated by considerations relating to efficient utilisation of resources utilised and the network infrastructure created, the latter is dictated by social policy objectives. These often appear contradictory goals and cannot be left entirely to market forces. Regulatory intervention for tariff rebalancing, therefore, continues to be relevant. In the Indian context it is evident that enhancing efficiency and investment in telecom needs application of appropriate regulatory mechanisms so that both investment and consumption of telephone services grow in tandem to attain the goal of fast growth in teledensity. An important objective of tariff policy is to provide incentives for competition while aligning prices towards cost particularly in the local network so that competition may be sustained over time. However, in the Indian context, the issue of affordability is an abiding concern, and tariff policy has traditionally subsidized services for low-end users. To encourage the use of telephones in rural areas, the extent of subsidy given to the rural subscriber has been higher than that for the urban subscriber. To the extent that this policy provides a disincentive for the service provider to invest in rural areas, an Universal Service Obligation (USO) Policy becomes an important complement to the tariff policy. In addition to the funding provided through the Universal Services Fund (USF), a cross subsidy is also provided in the interest of making latter affordable to the common man.
- 3.2 While examining basic services tariffs, one should consider whether the principles applied to both WLL (M) and Fixed Line tariffs should be the same, and if not, what differentiating factors deserve to be noted. This has to be seen in the background of the interaction of basic service market with the market for cellular mobile services, and the competitive overlap existing and/or developing between the two.

- 3.3 The Authority has recently decided on forbearance with most of the tariffs relating to cellular mobile services, taking note of the existing level of competition and the likely trend of greater competition in future in the cellular mobile market. The Authority has emphasized cost based tariffs for this sector, and expects market forces to provide such a tariff without undue regulatory intervention.
- 3.4 In the case of WLL (M), the Authority had specified in its Recommendations to the Government that the monthly rental would be fixed on the basis of Fully Allocated Costs, and that the Authority was not in favour of any subsidy being provided in the tariffs of WLL (M). The principle with respect to WLL(M) tariffs, therefore, is to determine them on cost basis.
- 3.5 For Fixed Line tariffs specifically for the so called Plain Ordinary Telephone Services (POTS), however, the objective of affordability is not easily overlooked. The principle governing these tariffs may, therefore, have to be different from that applicable to WLL (M). Nonetheless, even for Fixed Line, the starting point for determining tariffs is to ascertain the cost based tariffs for monthly rental and call charges, and then to determine whether these would be affordable. If the conclusion is that cost based tariffs are not affordable, the next step in the exercise would be to ascertain the tariff levels that should be put in place keeping in mind the concern of affordability. This would also give an indication of the extent of access cost deficit that would need to be covered from other revenue sources.
- 3.6 In this Chapter, we begin with a short discussion of the principles for determining cost based tariffs, and then consider the means of addressing the access deficit that arises on account of the rentals being below the cost based estimate. A more detailed discussion on various tariffs follows, beginning with the monthly rentals. This is followed by a consideration of the local call charge regime, and the tariff regime applicable to national (and international) long distance calls, and to the end users DID franchisees. The tariff levels for local calls would also provide the basis of demarcating origination/termination charge for these calls.

(a) **The framework for estimating cost based tariffs**

- 3.7 A determination of the cost based tariffs involves identifying the different elements in the access and the long distance networks and their utilisation in conveyance of local and long distance calls. This requires unbundling of the network and allocation of joint and common costs which are incurred in delivering the service for which cost based tariff is to be determined. In addition, we need to decide on the cost principle to be applied for estimating the costs, i.e. whether it should be historical costs, current costs, or forward looking costs, and whether the amount should be based on Fully Allocated Costs or Incremental Costs or any variant thereof.
- 3.8 The details of the unbundled network elements are given in Annex-III. The data for these network cost elements as well as operational costs have been obtained using the format given in Annex Table-III. The costs have been taken as current costs reported by service providers for the year 2001-2002. The principle of fully allocated costs has been followed to distribute the relevant cost heads based on cost causality which means that costs should be recovered from the source causing the cost to be incurred.
- 3.9 The joint and common costs in the network have to be duly segregated and attributed. This needs to be done on the basis of cost drivers that allow for the distribution of these costs. In this exercise, the distribution of Minutes of Use between local and long distance has been used for allocating capital costs and operational costs while estimating cost based call charges.
- 3.10 It is evident that at the current juncture the cost profiles of BSNL on the one hand and the private BSOs are vastly different. The present exercise derives profiles of rentals and call charges both for the new entrant as well as the incumbent. Cost figures have been calculated for a private BSO operating in a license area categorised as 'A' Circle, a private BSO operating in 'B' Circle and the

incumbent (BSNL). The rationale behind the approach is that it provides a comparison of standalone costs of an Access provider with the costs of the incumbent who has an integrated network and is both an access as well as long distance service provider. However it is noteworthy that rentals and local calls have been derived for both stand alone BSOs i.e., who do not provide NLD service bundled with local service, and the incumbent who is in a position to do so. For inter circle long distance calls, transmission costs as reported by the incumbent have been taken into account.

**(b) Various means of addressing Access Deficit**

3.11 Once the cost based tariffs are derived and a view about the affordable level for local service (rental/local call charges) taken, a detailed exercise will need to be conducted for ensuring that the access deficit i.e., the difference between cost based tariff and the affordable tariff, is recovered from other revenue sources such as IUC which is part of long distance tariff. If this is not done, the very purpose of keeping the rental low viz an increase in teledensity will be defeated. The presence of access deficit without an alternative source covering the cost element would then be a serious disincentive to the service providers and may hold them both from investing in the network or attracting more and more end customers.

3.12 The alternative sources of revenue to meet the access deficit include local call charge, the NLD and ILD calls, an Interconnection Usage Charge (IUC) received by the access provider from the long distance service provider, and the revenue obtained from the USO Fund. There is a complementarity between the revenues provided by the USO Fund and from other sources of revenue in as much as an additional amount of these revenues (including IUC) would imply a lower amount USO funding required to cover a particular revenue deficit. A noteworthy feature in this regard is also that the target of the USO fund is at present limited to remote and rural areas with greater focus on VPTs, while the access deficit arises in the case of DEL's in general i.e. even in urban SDCAs, because of rentals being less than the level computed by cost based methodology. Therefore, sources of revenue other than the USO fund will have to be found to meet the access deficit

for the basic service operator in general. In Chapter 5, this paper provides a calculation of average estimates of IUC including access deficit that have been prepared by the Authority. It must always be kept in view that any change in the tariff structure will have a bearing on the IUC.

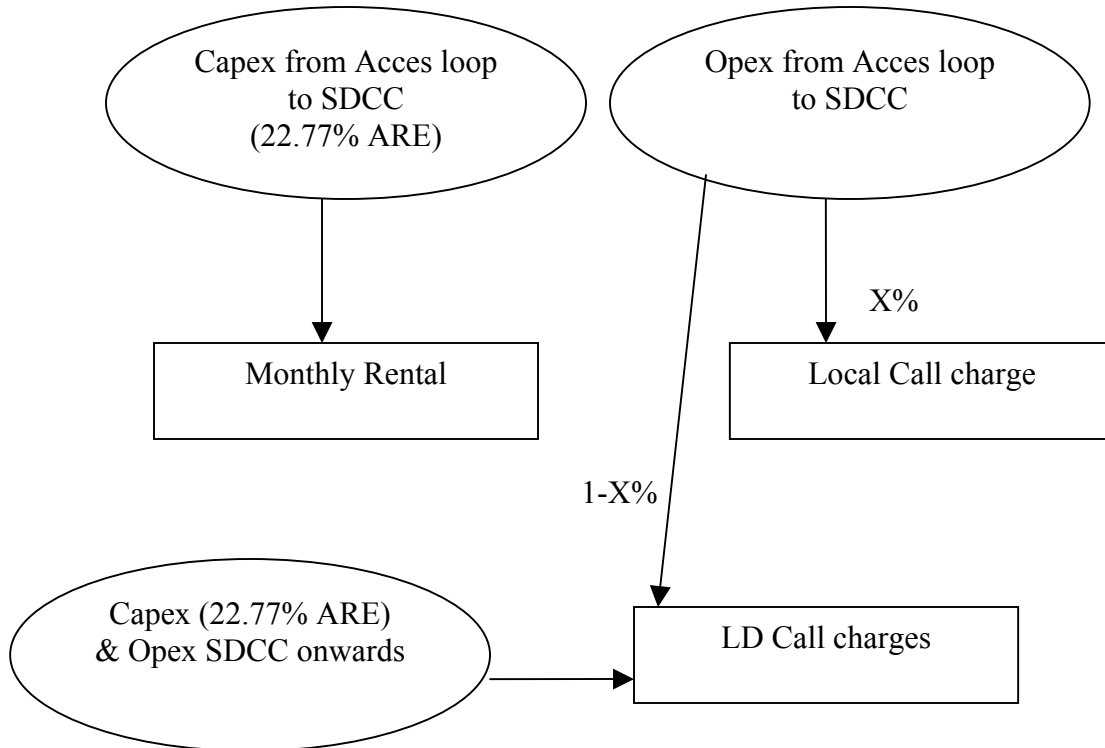
**(c) Monthly Rentals**

- 3.13 The previous tariff exercise conducted in 1998/99 had allocated all capital costs of the local network up to but not including the tandem exchange towards the cost of rental charges. For determining the monthly rentals for WLL (M), the Authority had taken into account a similar portion of the network, by considering the capital expenditure up to the Short Distance Charging Centre (SDCC). One outcome of this approach is that the local call charge would be lower, which viewed in the context of major sensitivity of most subscribers to call charges is important.
- 3.14 In the present exercise too, we propose to take the capital costs up to the SDCC (for more details of the network elements and the cost items, please see Annex-III). An important related issue is what portion of the capital stock should be allocated towards rental while determining its cost base. In the previous exercise, the entire capital stock was allocated to monthly rental.
- 3.15 A possible alternative is that capital costs for this portion of the network be allocated to monthly rental in the ratio of the minutes of use for local calls to the total minutes of use. These two different methods of cost allocation are given in the two scenarios under Chart 1 below. If Scenario I is adopted, then the cost based monthly rental is higher, and the access deficit is likely to be higher too. If the access deficit is allocated to national and international long distance calls in the ratio of their minutes of use as was done in the previous tariff exercise in 1998/99, the effect on the cost based tariffs for these calls would be the same as for Scenario II. However, in Scenario II, we have a lower cost based monthly rental, which would imply a lower extent of tariff re-balancing. However, in both scenarios, the IUC regime would have to ensure that the access provider is able to

recover the amount of access deficit (Scenario I), or the cost based charge relating to the portion of capital stock in the network up to the SDCC (Scenario II).

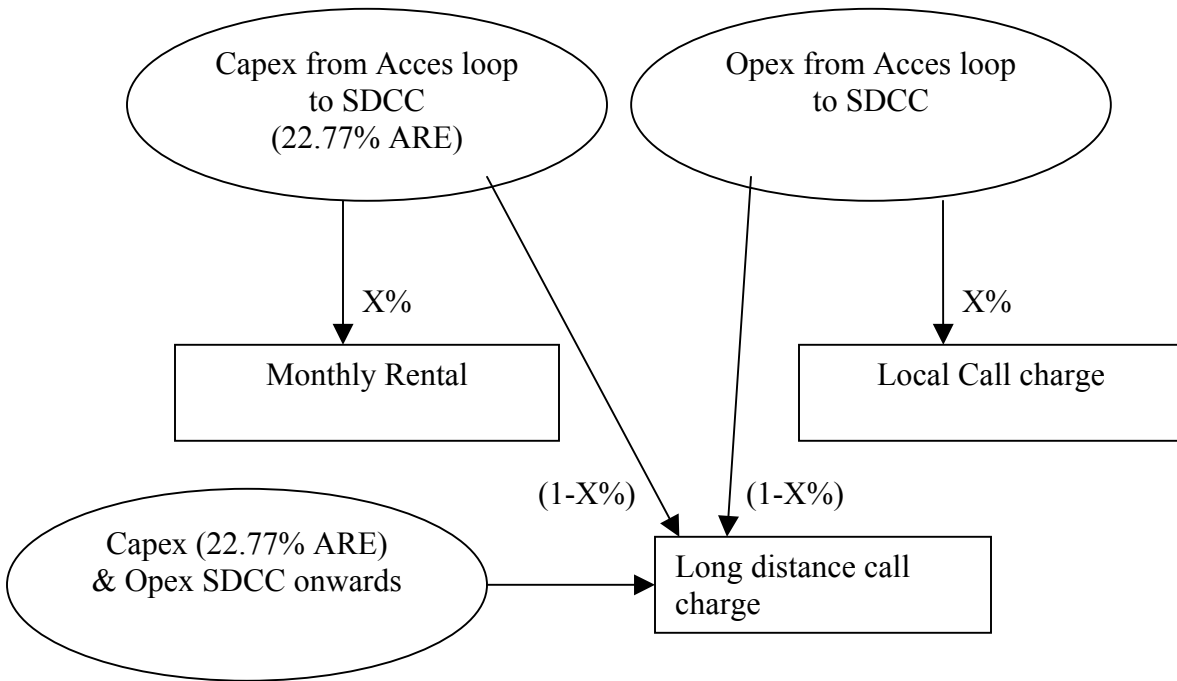
**Chart 1. Allocation of Capital Cost & Operating Cost**

**Scenario I**



Where X% is the proportion of local minutes in total minutes of use.

## Scenario – II



where  $x\%$  is the proportion of local minutes in total minutes of use.

- 3.16 In deriving the cost based rentals, an ARE of 22.77% has been used on the basis of the financial analysis carried out for the cost of capital and depreciation rates for basic services. Cost based call charges have been derived from attributable costs for local call charges as per the scenarios described above.
- 3.17 The issue of affordability will arise if the cost based rental is much higher than what is considered to be an affordable level of rental. While a higher monthly rental could reduce the amount of revenues shortfall which is likely in the case of low-end subscribers, this may also imply a reduction in the number of subscribers particularly low users and thus impact adversely both teledensity as well as the service provider's ability to spread the costs over a larger number of users. For growing networks like ours with a low tele density, a larger number of subscribers would also be desirable to obtain network externalities.



**Table 3.1. Estimates of cost based monthly rental (Rs. per month)**

	<b>Scenario-I</b>	<b>Scenario-II</b>
Incumbent	455	315
Private Operator "A"	442	296
Private Operator "B"	342	292

3.18 Table 3.1 shows that even with Scenario II, there will be an access deficit for monthly rentals, if we consider the present levels for these tariffs. An important question that arises, therefore, is whether the monthly rentals should be maintained at their current levels or should be increased in order to reduce the deficit and whether for instance this increase be limited by the increase in Consumer Price Index (CPI). A study conducted for TRAI by National Council of Applied Economic Research shows that increase in monthly rentals could adversely affect a rapid growth of subscriber base and the achievement of the teledensity targets. At the same time, there may be some scope to consider an increase, to the extent that average incomes are in general increasing by more than the inflation rate. A policy issue in this regard is whether the monthly rentals may be increased by about the inflation rate, and if so, whether the increase should apply for all monthly rentals or only for specified categories e.g. urban, commercial or any other.

3.19 During the past three years, the cumulative increase in consumer price index for industrial workers has been more than 10 per cent. If we increase the monthly rentals by about 10 per cent, this would imply the following monthly rentals:

- Rs. 250 per month would become Rs. 275 per month;
- Rs. 180 per month would become Rs. 200 per month;
- Rs. 120 per month would become Rs. 130 per month; and,
- Rs. 70 per month would become Rs. 75 per month.

3.20 To the extent that monthly rentals are changed, there will be a decrease in access deficit and this fact should be taken into account in the access deficit that is provided through the IUC payments as part of long distance tariff. A decrease in such access deficit, and hence IUC, would allow the market competition to reduce the tariffs for long distance calls. A noteworthy point to consider when deciding the levels for the monthly rentals for Fixed Line is the interaction that it is likely to have with respect to WLL (M) and cellular mobile, and the monthly rentals for these services so that the changes in monthly rentals are not brought about in a manner which reduces the spread of basic Fixed Line service called 'POTS' which is considered an essential service in developing countries like ours.

3.21 Another policy consideration to bear in mind is that if an overall price cap is decided based on concepts like CPI-X as the appropriate regulatory policy, then whether monthly rentals should be subject to the types of constraints that have been mentioned above or be left to the operators to fix.

**(d) Local call charge**

3.22 For cost based local calls, the previous Tariff Study had estimated the cost based charges using the operational costs attributable to local calls. This was done by allocating a share of operational costs to local calls, by taking a share that was equal to the minutes of use of local calls in total minutes of use. In effect, this process is similar to the allocation principal used in Scenario II in Chart 1.

3.23 The Authority has calculated the costs attributable to local calls, based on the above methodology. For BSNL, the operational costs taken into account are different from those applicable to Department of Telecom in the previous exercise, because the cost principles applied by BSNL are different, i.e. they are commercial principles. The cost based local charge estimates indicate that if we take call duration of three minutes, then a slight upward revision of call charge may be required.

- 3.24 The average duration for calls has been estimated at about two minutes in comparison to 2.5 to 3 minutes in the previous exercise undertaken in 1998/99. Taking the local call duration as two minutes, it may be worth considering whether to have a pulse duration of two minutes for the local call i.e., 120 seconds instead of 180 seconds at present. Another point to consider in that event would be whether to reduce the call charge also by some amount for a shorter call duration, and if so how much. Furthermore, would it be appropriate and/or technically feasible to have a fixed call set-up charge for all calls, which may be different from the charge applicable to the metered call units which is based on duration of the call and the applicable pulse rate. Importantly, what should the amount be as the amount in this case becomes a relevant question to address.
- 3.25 To discuss all the above issues, it is important to have some estimates that could provide a basis for discussion. The estimates of cost per minute for local call have been calculated for two private sector service providers and for BSNL. These estimates (without taking account of revenue share License fee), range from Rs. 0.40 to Rs. 0.51 per minute. The weighted average would be very close to the estimate for BSNL. Taking the License Fee revenue share and a 10% mark up for the BSNL estimate, the cost per minute would come to approx. Rs.0.50. However, if we take a simple average of the estimates shown in Table 3.2 below the corresponding cost per minute would be Rs.0.55. On this basis, if we take a pulse duration of 120 seconds, and a call charge of Re. 1/- to Rs.1.10 per metered call unit, would that be an appropriate charge?

**Table 3.2 Per minute cost of local call**

	<b>Local call charge per min.</b>
Incumbent	0.40
Private Operator "A"	0.41
Private Operator "B"	0.51

- 3.26 Alternatively, if a different charge for call set-up can be put in place, then what should that amount be, and how should that affect the charge per metered call unit? For example, would it be appropriate to have a call set-up charge of Rs. 0.20/30 per call and Rs. 0.80 or 0.90 for a pulse duration of 2 minutes.
- 3.27 Yet another alternative would be a combination of pulse duration and call charge in a situation where a double pulse may be given at the beginning of each call, for instance a double pulse to begin with and a pulse duration of one minute and a charge of Rs. 0.40 or 0.45 per pulse.
- 3.28 Another point to consider is whether the call charge for WLL (M) should be different from that for Fixed Line, on the grounds that the average minutes of use for WLL (M) may be different from those applicable to Fixed Line service because the latter is likely to be used by a larger number of persons being available at the spot where it has been fixed, and the WLL (M) may be available for a substantial period of time only to the person who carries it out in the area covered by limited mobility. Also, a spectrum charge component needs to be added to the cost base for WLL (M). These and other issues in the form of questions are summarized at the end of the Chapter for consultations.
- 3.29 If the price cap methodology i.e., CPI – X is adopted as the regulatory regime, then we would need to consider whether any limits should be imposed on the extent of the change in local call charge per se. Also, to the extent that there are changes in the local call regime, the effect of this on the IUC regime would need to be kept in view.

(e) **Origination/Termination Charge for Local Calls**

3.30 The call charge specified for local call from basic service gives a basis to provide termination charge for the network on which the call terminates. The simplest way to decide the termination charge would be to take it as half of the specified local call charge per minute. In this regard, another aspect to consider would be whether the termination charge should be provided to the cellular mobile network when the calls originating from basic service network terminate in that network, and also whether for calls which originate from the cellular mobile network and terminate in the basic service network the termination charge should be the same as that for termination of calls from one basic service network to another.

3.31 At present for interconnection of two local networks (PSTN) in a local area (SDCA), the originating subscriber pays for the total call i.e., both the local loops and the principle of sender keeps all is followed. However in case of a PSTN to PLMN or PLMN to PSTN call, it can be argued that origination and termination in the PSTN local network involves only one local loop and lesser number of network nodes and that for call termination in a local network the cellular network should pay lesser than the full charge for a local call.

(f) **Tariffs for National and International Long Distance Calls**

3.32 The prevailing tariffs for both national and international long distance calls are below the ceiling levels specified by TRAI in the third tranche of tariff rebalancing. Market pressure has brought the price nearer the cost of long distance calls thus, substantially achieving one of the objectives of the rebalancing exercise i.e. of lowering long distance charges. However, this would imply another kind of imbalance, given that there is no corresponding increase in rental/local call charges. The present exercise will examine this aspect of tariff rebalancing and try to work out new affordable local tariffs and provide for ADC, to address any imbalance.

3.33 Given that competitive pressures are likely to increase, the following points merit attention. One, there will be considerable pressure on prices on account of the introduction of Voice Over Internet Protocol and Internet Telephony. Two, the Authority has begun a process under which Interconnect Usage Charge will be agreed among the service providers in such a way that the surplus available with either the access provider or the national long distance operator will be more clearly identified than has been possible till now. It is important that some flexibility be retained in this process and that market interplay and competition be allowed to be reflected in the developments regarding these tariffs. It is noteworthy that the access deficit i.e. shortfall in rentals as well as any shortfall in the costs of providing calls are taken into account while determining the IUC to be paid to the access provider.

3.34 Three different policy responses for national/international call charge would appear possible:

- i) To let market forces regulate the tariff and bring about the reductions in NLD/ILD charges;
  - ii) the market be initially left without any constraints, and based on its monitoring of the market price, the Authority intervene if required;
  - iii) ceiling tariffs be specified for the service, and the market be allowed to operate within the specified ceiling;
- If the third alternative is chosen, some further questions arise, viz. to the extent that the Authority may decide on specific ceiling levels for these tariffs, what should be the basis for determining these ceilings;
  - Also, should a ceiling be specified as a one off level, or should there be a transition over a period of time, e.g. 2-4 years, towards a lower level from the existing level of the ceilings.

3.35 If ceilings for call charges have to be specified, then we would need to estimate cost based charges for these calls. In view of the indicative estimates of IUC for national long distance calls that have been calculated by the Authority, we already have a basis to consider the ceilings for these charges. A reasonable mark-up on these costs could, for example, give us the requisite ceilings.

3.36 Likewise, further work on the cost of providing international calls could give us a basis for the ceilings, with the costs calculated for stand alone service provider of these services. However, these ceilings may not be worthwhile if the market develops with Internet telephony, and the market price stays substantially lower than the cost based ceilings calculated for these tariffs. ILD sector is likely to be the most competitive of the three segments of the PSTN (Access/NLD/ILD).

**(g) Free calls**

3.37 At present, the standard tariff package specified by the Authority provides 60 metered call units (urban) and 75 metered call units (rural) per month as free calls. It is worth noting that if the option of call set up charge is to be implemented for local call charge, then there will be no entirely free calls. For each so called free call, there will be a call set up charge.

3.38 Another approach to free calls may be that a reduction in the number of free calls may be considered, subject to suitable adjustments in regard to rental. Yet another possibility is to consider a reduction in free calls, irrespective of the approach adopted in respect to monthly rentals. In any case, if a lower number of free calls is to be permitted, the issue for discussion would be how to determine the appropriate number of such calls.

3.39 To the extent that there is any reduction in the free call allowance, the implication of this for the IUC regime has also to be kept in mind.

**(h) Tariffs for end users of DID Franchisees**

3.40 The Authority has emphasised the possibility of cheaper access being available to low users through DID franchisees. That is an important reason for specifying a lower monthly rental and call charge for these end users. Given the emphasis on encouraging access to these services, the Authority would like to maintain a low monthly rental, such as Rs. 100/- per month, per extension for these services. However, with a change in call charge for basic service calls, it would be necessary to take another look at the charges for these calls too. To encourage these services, it would be necessary to provide a suitable discount for call charges for DID end users in comparison to the call charges for regular phone lines. Important policy considerations in this regard would include:

- what should be the extent of discount that should prevail for the call charges for DID franchisees;
- should the Regulator specify such a discount, or should this be left to be specified by the franchiser.
- Should the Regulator specify the call charges on the junction lines connecting the DID PABX to the local network in view of the linkage between retail tariff charged from extension users and wholesale tariff i.e, on junction calls.
- Should DID Franchisee tariffs be totally deregulated and left to market forces.

**3.41 In the light of the discussions in pre-paras, the following question are brought up for consultation:**

- 1. Which are the network elements whose costs should be taken into account for fixing cost based rental? Should only the non-traffic sensitive portion of the network such as local loop be taken into account or other elements which are traffic sensitive such as local exchange, junction network etc. should also be accounted for, as done in the previous tariff exercise?**
- 2. What level of rental is considered affordable and such that it will not affect demand adversely?**



- 3. What cost model should be adopted for determining cost-based rentals? For example, is long run incremental cost an appropriate methodology for determining cost-based prices at this stage of our market development?**
- 4. What rate of return of funds employed should be considered reasonable and used for determining a cost based price? How should common or joint costs be allocated to specific services such local, NLD and ILD?**
- 5. Should monthly rentals be increased for certain category of subscribers such as commercial? If rentals may be increased, can some objective criterion be developed for deciding the extent of such increase and the consumer segments to whom such increase may be made applicable (e.g., for all subscribers; for certain user-groups such as business subscribers, residential subscribers, rural subscribers, non-rural subscribers)? What criteria should be used for determining subscriber categories whose rentals should increase?**
- 6. Does the methodology of determining tariffs for local calls need to be changed e.g., should there be a change in the pulse duration, the number of pulses at the beginning of a call, or a combination of call set up charge and reduced pulse rate? If yes, then what should be the pulse duration and the call charge therefor that should be introduced so as to cover all costs, including license fee. Or may the cost of a local call not be fully covered from local call revenue?**
- 7. Should the call charge for WLL (M) be the same as for Fixed Line call charge? If yes, why? If not, why not?**
- 8. If a regime of origination/termination charge is introduced for local calls, should the same termination charge as in the case of a basic-to-basic call be applied in the case of an incoming call into basic service network from cellular mobile service?**
- 9. Should the current number of free calls continue to be provided, or should the free calls not be provided at all? If free calls were not to be provided, then should a specified number of initial calls be charged a lower/higher price than subsequent calls? What should be the basis of specifying any such number and what should be the link between the price of these initial calls and the subsequent calls? Should there be any link between the monthly rental and the number of free calls?**

- 10. What is the likely effect of the developments in the NLD market such as entry of new players on the STD tariff? Do we have enough competition in this segment of the PSTN to let market force determine the tariff? In such a scenario how do we meet the access deficit of the local network?**
- 11. If the national STD distance-based tariff system were to be changed to better reflect costs, should the discrete distance-slabs as in the present structure of tariffs be retained, e.g. should there be a single distance slab "Above 500 kms". Is there any view about there being an optimum number of distance slabs for an objective criteria based NLD tariff structure. If so, what would be desirable objective criteria to be used for deciding on number of distance slabs and the distances these should cover?**
- 12. What should be the regime for call charges for end users of DID Franchisees? Should the Authority specify the charge or should this be left to the franchiser? If the call charge has to be fixed, what should it be? Should it have any linkage with the call charges of the junction linking the DID PABX and the local network of the franchiser? Should both be left to market forces?**

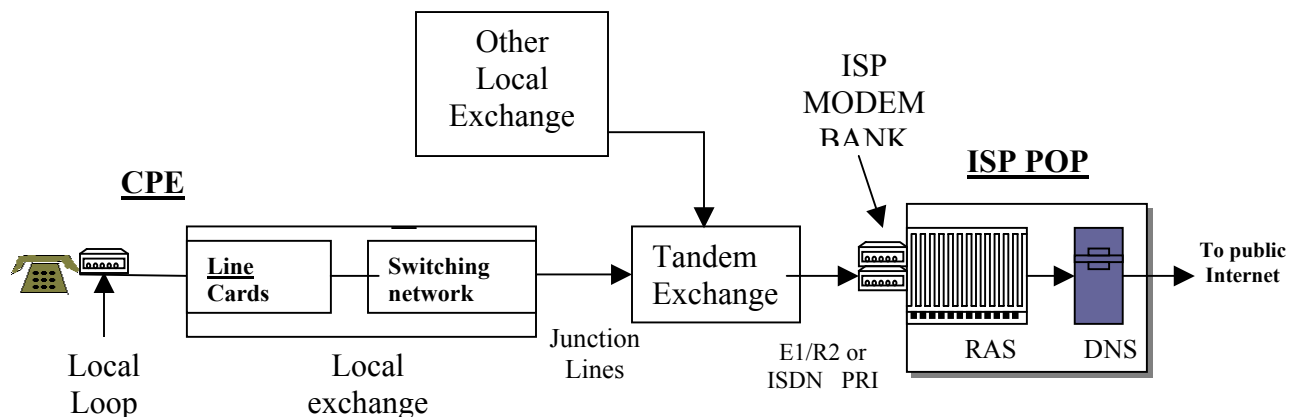
#### IV CALL CHARGES FOR DIAL UP INTERNET ACCESS OVER PSTN

4.1 Dial up Internet access over PSTN has been the most popular means of accessing the Internet. Market research widely predicts that dial-up access will remain the dominant method of accessing the Internet among residential users and small businesses in the foreseeable future. Notwithstanding the developments in broadband access, dial-up customers will continue to account for a substantial share of the Internet service market.

(a) The issues

The schematic diagram of a dial-up Internet access set up is given below:

**Chart 4.1 Schematic Diagram of a Dial Up Internet Access Setup**



The various resources required for a dial-up Internet access are the following:

1. Local Loop to customer premises (dedicated to the customer)
2. The line interface card in the local exchange (dedicated to the customer)
3. The switching network part of the local exchange used on the basis of call duration (traffic sensitive part).

The cost of a dial up call for internet access will be a function of the duration for which switching network part of the exchange is utilized.

- 4.2 A Customer Survey conducted by TRAI showed that a largely held view favoured a reduction in the dial-up call charges since these constitute a major part of expenditure on Internet access and are thus seen as inhibiting the growth of Internet in the country. More recently, a Task Force set up by the TRAI, consisting of eminent experts to provide policy suggestions for accelerating the growth of the Internet services in the country has also emphasised, inter alia, a need to reduce call charges for internet dial up access to stimulate the higher usage of Internet. This is, therefore, an issue which the TRAI wishes to address by seeking ways of implementing lower call charges applicable to dial up Internet access.
- 4.3 The TRAI has been considering the possibility of implementing a reduced call charge for dial up Internet access in consultation with BSOs. In discussions relating to this issue, several Basic Service Operators (BSOs) felt that a reduction in this call charge would be detrimental to them as it would lead to network congestion and loss of revenue accruing from high value calls (e.g. STD calls). They also mentioned that the resources utilized for Internet access calls are more than those utilized for voice calls because of higher holding time in case of the latter. According to BSOs, the local call charges are below cost and the resources utilised for setting up of a dial-up internet call is the same and thus there is no scope for any further reduction.
- 4.4 In this regard, it is noteworthy that the cost basis used to determine the cost of a local call charge is operational cost attributable to local call minutes. This cost consists mostly of cost items which are not variable with usage i.e. the costs that are predominantly not linked to usage of the network, e.g. staff salaries, wages and marketing expenses. Thus, the per minute cost for local call could come down over time because the Minutes Of Use (MOU) are likely to increase at a faster rate than operational costs. This trend will be further strengthened due to an increased usage of Internet if the dial-up call charges are reduced.

4.5 Nonetheless, the issue raised by BSOs would still remain relevant, namely the switching network getting congested due to the longer holding time for internet calls, and that in situations of capacity constraints these calls may block-out the more lucrative national/international long distance calls. Some BSOs have also mentioned that cheaper dial up call charges may lead to greater usage of Internet telephony, and thus to a larger fall in the revenues from International Long Distance calls.

**(b) International situation**

4.6 There is a wide variation in the dial up charges for internet access among different countries. For example, Table 4.1 shows a range for selected countries where the ratio between the highest and lowest costs is about four to one. The charges in India are in the upper end of the estimates shown in Table 4.1. At current tariffs, the average for a 20 hours package in India is about US \$ 7.

**Table 4.1 Dial-up Call Charges for Indicative 20 hours package of Internet access for Selected Countries (based on ITU data for 2000)**

Country	Dial Up call charges for 20 hours package (US\$)
Argentina	6.0
Brazil	6.0
Chile	3.45
Indonesia	2.85
Israel	4.39
Malaysia	9.47
Singapore	4.94

Source: ITU

4.7 In some other countries like USA, Canada, France, Hong Kong, Luxemburg, New Zealand, Philippines, Russia, Pakistan, Korea, Mexico and Portugal either free local calls are offered for unlimited Internet usage, or a flat charge is levied together with the line rentals. An example of a country which has recently adopted a flat rate reduced charging scheme for internet access is the United Kingdom.

4.8 The OFTEL (UK Telecom Regulator) reviewed the extent of effective competition in the dial-up Internet access, including the markets for call origination, call termination, wholesale internet call origination and retail Internet service provision. Most residential consumers in UK use the dial-up as the standard facility available. The dial-up access of internet was defined in terms of using bandwidth up to and including 128 kbit/s. Call origination and termination was defined from the perspective of a consumer making the call and as there was no substitutability in the case of dial-up, it was found that some cost investments would need to be incurred by the supplier of origination if a flat reduced rate charging was to be adopted. Regulatory intervention in the UK in the dial-up access market was affected through a direction which required BT (the incumbent Basic Service Operator) to provide an un-metered wholesale service that enabled ISPs to supply un-metered internet access using BT's network for call origination (called Flat Rate Internet Access Call Origination, or FRIACO). It is understood that this arrangement called for substantial additional investments on part of British Telecom (BT), the incumbent, to get over congestion.

(c) **Alternative solutions to the issues**

4.9 The solutions to the above issues can be sought in the technical and/or the tariff area.

- 4.10 There are now technical solutions available which may be able to address the concerns of those BSOs who feel that reduced dial up call charges may result into congestion in their network and hence adversely impact their revenues from voice services. In this context it is worth mentioning that now new access technologies like Direct Internet Access System (DIAS), corDECT wireless access, Internet Lease Access Line Doubler (ILALD), DSL etc. are available which enable the simultaneous voice and Internet call over the same access loop and thereafter offloading the Internet traffic to ISPs node without loading the core network such as local exchange, functions, tandems, etc. In addition, these new access technologies can help to provide better data rate to the Internet users and offer the possibility of 'Always-on' Internet. Instead of charging for dial-up access calls, a flat charge on the monthly basis may have to be levied to recover the capital cost of the additional equipment required in the exchange for this purpose.
- 4.11 Certain tariff options provided by the basic service operators suggest some flexibility in their ability to reduce the dial up call charge. There have been some instances of the established basic service providers giving cheaper Internet services on the assumption that the increased usage of internet would increase their dial up revenues. To the extent that the revenue from dial-up calls presently would cover more than the costs of the dial-up calls, this would provide an opportunity to offer cheaper dial up calls. It may be important to consider such a policy in the national interest of growth of Internet services in the country.
- 4.12 The issue of an adverse revenue effect would arise if there is a capacity constraint and the system would either carry both the 172xxx and STD ('0' & '00') traffic during the same busy hour. In this regard, it is also worthwhile to consider whether the busy hours of Internet Dial-up access and STD coincide. In case they are different, the Internet dial-up calls i.e., 172xxx may not cause any congestion as far as STD traffic is considered. During off-peak hours i.e. there may be adequate capacity available for both the Internet access dial-up calls and the higher revenue STD calls. Generally, busy hours of Internet usage have been indicated between 7.00 A.M. to 10.00 A.M. and 5.00 P.M. to 11.00 P.M.

- 4.13 It may also be worth considering as an option that dial-up call charges i.e. on level 172xxx may be suitably reduced for off-peak hours (11.00 P.M to 7.00 A.M.) during which the switching resources of the local exchange may be idle. International best practices specially in developed and developing countries also support this differentiation for making optimum utilisation of resources, at different hours, due to non coincidence of busy hours for different types of traffic streams..
- 4.14 Another view could be that tariffs for dial up access need to be lower in order to encourage the use of internet in the country, and with such a tariff reduction there will also be a need to increase capacity so that both the local dial up calls and the STD calls may be handled together by the network, without one adversely affecting the other's revenues.
- 4.15 Based on the above discussion, the following issues are brought out for consultation:**
- a) Is there a case for reduction of dial-up call charges for Internet usage based on the cost?**
  - b) Based on the lean usage pattern during off-peak hours can the call charges for internet access i.e., on level 172xxx be reduced during off-peak hours as is done in case of STD calls?**
  - c) Whether the reduction in dial-up access charges for Internet will result in increase in usage and hence more revenues for the BSOs?**
  - d) What are the barriers for BSOs to exploit new technologies to provide simultaneous voice and Internet calls and offloading the internet traffic from the core switching network to avoid network congestion, if such a congestion is really apprehended?**
  - e) Do we have any other engineering solutions i.e., based on the technology already deployed to solve the problem of congestion due to excessive holding time of a dial-up Internet calls?**



V. **INTERCONNECTION USAGE CHARGES (IUC)FOR NATIONAL LONG DISTANCE CALLS**

- 5.1 In terms of the Telecommunication Interconnection (Reference Interconnect Offer) Regulation, 2002 (2 of 2002) issued on the 12<sup>th</sup> of July 2002, Telecommunication Service Providers holding significant market power are required to publish Reference Interconnect Offer (RIO) based on the model RIO annexed to the Regulation. The RIO will stipulate the concerned Service Provider's terms and conditions on which it will agree to interconnect its network with the network of any other service provider seeking interconnection. The RIO issued by the service provider will prescribe the technical and commercial conditions for interconnection, which will be based on the model RIO and the guidelines annexed to the regulation. The charges for interconnection are expected to be agreed between the seeker and the provider mutually.
- 5.2 Interconnection Usage Charges (IUC) are required to be paid by one operator to the other(s) involved in carrying a call for originating, terminating and carriage of traffic. The manner of their payment has been indicated in Article 13 and Schedule 6 to the model RIO. The usage charges payable for originating and terminating access will have to be derived taking into account the costs of the network elements from the subscriber station up to the Short Distance Charging Centre (SDCC). For recovering these costs, reliance is placed on the monthly rentals. However, when the rentals are below cost, there will be an access deficit cost i.e. the amount by which the rentals are below cost. This will need to be recovered from other sources.
- 5.3 An effort has been made in this paper to estimate cost based IUC including a license fee revenue share, taking into account the present regime of monthly rentals. The estimates in this Chapter include the cost of a call, the access deficit reflecting the difference between the cost based rental and the tariff that is charged as monthly rental, and the cost of providing 60 metered call units as free calls. As and when the tariff regime is altered/modified by regulation, there would be a need to amend the estimates of IUC. A comparison of the estimated IUC

with the prevailing tariffs shows that these two are not the same for different distance categories applied for national long distance calls. When the estimated IUC is compared with the prevailing tariffs, the results depend on with whom is the surplus from the tariff retained. In so far as NLD tariff is concerned one view can be that the tariff belongs to the NLD operator who has to be left with the surplus/deficit after paying IUC for origination and termination. It is important that the access providers be given incentives to invest in the capital intensive portion of the network, and to attract as many subscribers as possible. This would also be useful to achieve the objective of rapid tele-density growth.

5.4 This Chapter begins with a summary of the results of the three different methods used to assess the average charges required to cover the cost of long distance calls. This is followed by a discussion of the detailed exercise conducted to estimate the IUC based on cost data from BSNL, using a bottom up approach. The methodology and the average estimates for the IUC are provided, with the IUC estimates being specified in terms of both the Schedule 6 that is given in the model RIO as well as in a framework of the origination, carriage and termination cost based charges for the distance categories for which NLD tariffs are presently offered in the market. The Authority is also seeking the opinion of stakeholders on the issue that if certain IUC are to be specified by the Regulator as Guidelines then whether a range instead of a single estimate would be the appropriate benchmark for each distance category. The Chapter also raises the issue of the method with which to determine the range, so that the Regulator may specify consistent and tenable benchmarks for IUCs.

(a) **Three approaches to determine IUC**

5.5 For the derivation of IUC, the following three approaches have been applied:

- Top down : Beginning with the actual overall cost of the entire network and then breaking it downwards following the allocative method. Costs are allocated to different services and then downward to the different levels of the network and functions in providing the services.

- Bottom-up : Based on optimal network engineering model, a proxy model, capable of meeting the service requirements of a given subscriber and traffic profile is developed. Since it is a proxy model, while estimating the capital cost of the network is not so difficult, assessment of operational expenses is always a challenge. This problem can be addressed by adopting and working with the ratio of capital to operating expenses, which represents the industry best-practice in this regard.
- Outside-in: “best current international practice” based on benchmarks of other countries with somewhat similar demographic and economic situations. It does not reflect actual costs and operating conditions but certainly provides fair benchmarks and efficient models to compare with. The task of developing these cost figures and benchmarks was assigned by the TRAI to the internationally well known firm ‘OVUM’ of U.K. who are reputed experts in matters relating to Telecom interconnections and charges in respect thereof.

**(b) Summary results of the three approaches**

5.6 Tables 5.1 and 5.2 below compare the main results of the IUC estimates from the three approaches. The total estimate for IUC has been calculated under the bottom up and top down approach, taking account of the access deficit as well as the cost of free calls. The top down approach considers the annual data on traffic and its distribution, cost of transmission network as furnished by BSNL and the corresponding cost per line figures. Data on traffic, investment, DELs and TAX lines have been taken from the information provided by BSNL and the Annual Report 2000-2001 of the Department of Telecom. The information on operational costs is from the Annual Report of BSNL for 1999-2000.

5.7 Of the three approaches, those pertaining to the bottom up approach are the most relevant for this exercise, because they are based on a detailed analysis of the cost figures for a range of different operating conditions, and have closely followed the methodology that relates to the framework of the model RIO.

**Table 5.1. Comparison of Average IUC estimates for origination/termination obtained by the three approaches for National Long Distance Calls**  
(Rs./minute)

Type of charge	Bottom-Up Approach			Top-down Approach			Best International practice (OVUM Benchmark study)
	Cost	ADC	Total	Cost	ADC	Total	
Origination / Termination	0.23	1.19	<b>1.42</b>	0.55	1.16	<b>1.71</b>	<b>0.93</b>

Note: “ADC” is the estimate of access deficit charge and includes both the excess of cost based rental over the rental specified and the cost of free calls. The estimate for cost in the bottom up approach includes revenue share License Fee of 12 % but not any mark up.

**Table 5.2. Comparison of Average IUC estimates for carriage of National Long Distance calls obtained by the three approaches for National Long Distance Calls**

(Rs./minute)

Type of charge	Bottom-Up Approach			Top-down Approach			Best International practice (OVUM Benchmark study)
	Carriage	Termination	Total	Carriage	Termination	Total	
Transit (1 TAX)	0.17	1.42	<b>1.59</b>	0.61 (average for all)	1.71 (average for all)	<b>2.32</b> (average for all)	<b>1.83</b>
Transit (2 TAXs)	0.32	1.42	<b>1.74</b>				<b>2.35</b>
Transit (3 TAXs)	0.73	1.42	<b>2.15</b>				<b>2.54</b> (average for last two categories)
Transit (4 TAXs)	0.90	1.42	<b>2.32</b>				

Note: The cost of termination is the same as the total cost of origination/termination shown in Table 5.1. The amounts for carriage in the bottom up approach include revenue share License Fee of 12 % but not any mark up.

- 5.8 The IUC figures obtained from the three approaches are broadly consistent for NLD calls that would cover relatively longer distances, e.g. distance slabs above 50 Kms. This is significant in view of the share of calls in the last two distance categories (i.e. above 200 kms.) accounting for a large portion of the total long distance calls. Table 5.2 shows that the benchmark estimates from the OVUM study are somewhat higher than those from the bottom up approach, but this is because while the former are in the nature of tariffs or wholesale prices which include a mark up, the latter are only cost based estimates without mark up. Including a mark up in the bottom up cost estimates would result in reducing the difference.
- 5.9 For origination/termination (Table 5. 1), the estimates of IUC obtained using the top down and bottom up approach show a variation mainly because of the different data base used. The top down approach used operating expenses for the year 1999-2000 for which audited accounts for the entire year were available from the incumbent. Capital costs were used from the earlier information obtained from the incumbent and used in the Authority's consultation paper on the Universal Service Obligations. The bottom up approach has used more recent data.
- 5.10 The estimate of IUC for origination/termination from the OVUM study are lower than those obtained from the bottom up and top down approach. A major reason for this is the high access deficit that arises due to the relatively lower Indian tariffs for rentals and the cost incurred in providing free calls, in comparison to the benchmark countries. The lower Indian rentals and the provision of free calls reflect the objective of socially desirable tariffs to promote affordability.
- (c) **Detailed IUC estimates using the Bottom Up approach**
- 5.11 As mentioned above, the bottom up approach has used detailed estimates of costs from a number of Circles covered by BSNL, and thus represents the type of exercise that would be relevant in the context of the framework that has been

provided in the model RIO. The average estimates have been derived based on the data from seven circles namely, Gujarat, Jharkhand, Kerala, North East-II, Orissa, Punjab and Rajasthan. The capital cost data available from the BSNL for the unbundled network elements have been used, applying a fully allocated cost principle.

- 5.12 The bottom up approach uses a proxy network model with location and number of lines remaining as at present but employing the optimal contemporary techno-economic switching and transmission technology options based on traffic considerations. The transmission systems between a local exchange and SDCC Tandem have been considered as employing 8/34 Mbps systems or STM 1 OFC systems based on traffic carried on the link. Similarly, between SDCC Tandem and Level II TAX, transmission systems could be 34 Mbps or STM 1 OFC systems. Inter-Circle and Intra-Circle transmission networks between TAXs are designed on STM 4 / STM 16 OFC rings.
- 5.13 For estimating the IUC, network elements have been sufficiently unbundled so that the IUC relates to the costs relevant to the network elements used. For shared network resources, the relevant costs considered are those that are attributable to each service in proportion to their respective minutes of usage. Cost of software has been included in the equipment cost and not considered separately. The costs that are directly attributable to carriage of a call between a subscriber and the Point of Interconnect (and vice versa) viz. costs of provisioning, maintenance and operation of associated switching and transmission plant, common costs like power plant, and overhead costs that include personnel, finance, administration and IT support costs have been considered. As the Operating expenses are not available individually for the seven Circles considered, the national weighted average has been used in determining IUC figures in each of them. The access deficit and cost of free calls have been allocated in a manner that full costs are recovered but no cost is appropriated more than once.

- 5.14 As the data on costs are based on the inputs received from the BSNL, the incumbent, the entry fee for award of a license is not included in the capital cost. Costs of unbundled Signalling and Call-related databases have also not been considered since the incumbent's plan for introduction of unbundled signaling links and signal transfer points on stand-alone basis, and providing access to Toll free calling database, Number portability database, Advanced Intelligent Network (AIN) databases, etc., are not yet known. Administration and finance costs for billing have not been added to the originating access charge, as these may be determined by mutual negotiations between the Access Providers and National/International long distance Operators. For the payment of IUC, cascade mode of operation has been assumed.
- 5.15 The costs have been calculated in the framework that is provided in Schedule 5 of the model RIO (please see Annex IV for this schedule). Since this data is operator specific it is considered commercially sensitive and is not provided in this paper.
- 5.16 The capital costs per line have been specified in the various categories given in schedule 5. The capital cost for the access loop and building costs were adjusted to reflect an efficiency factor taking account of the costs of efficient private sector operators. For the optical fibre cable (OFC), average costs were calculated to reflect the relatively longer life of the asset and the likely increase in usage over time. For OFC, therefore, an average usage was determined on the basis of the average usage over a ten year period, and the minutes of use were derived on this basis to calculate the per minute costs.
- 5.17 Operational costs were derived on the basis of the BSNL's balance sheet for the year ending 2001 which contains data for 6.5 months, i.e. mid-September 2000 to March 2001. The operational costs were projected for a twelve month period and divided into two categories, namely bad debt and others. The latter category of operational costs were allocated to the different items in schedule 5 in the same

- ratio as for capital costs. The bad debt were allocated over the different revenue categories in the proportion of the total revenues that they account for. Thus, 20 per cent of the bad debt was allocated to rental. Of the residual bad debt costs, local calls account for 44 per cent (i.e. their share in total metered call units) and the rest is allocated to long distance calls.
- 5.18 An annual recurring expense equivalent of capital expenditure was derived using an ARE of 22.77 per cent. The cost based monthly rental was derived taking the capital costs of the unbundled network elements up to the short distance charging center (SDCC). This includes the access loop, local exchange, SDCC Tandem (except for digital interface for long distance connectivity to long distance charging center TAX), and the LE-SDCC Transmission system and Link/medium. An average cost based rental was derived by taking a weighted average of the costs for the seven circles used as sample.
- 5.19 An estimate of access deficit was obtained by deducting the prevailing weighted average rental from the cost based rental (including bad debt). The average estimate of the prevailing rentals takes into account the fact that the TRAI has allowed a higher monthly rental for the commercial customers. The estimate of access deficit is Rs. 244/- per month per DEL. Such access deficit in the past was covered by the incumbent from the long distance calls. In the changed multi-operator, multi-service scenario too, for covering this deficit, alternatives are difficult to find and one may have to rely on the same source, i.e. long distance call revenue.
- 5.20 The per minute cost of origination/termination has been calculated on the basis of the operational costs (including bad debt) allocable to the local calls. The total operational cost was taken for the same network element categories as those applicable to monthly rental. This operational cost was allocated to local calls and long distance calls on the basis of the minutes of use (MOU). The resultant costs were divided by the MOU of local calls to give the per minute local call



cost. Since origination and termination charges were both being considered in the exercise, the MOU used were for both incoming and outgoing calls.

5.21 The following figures of total incoming and outgoing call minutes were used to calculate the per minute charges for origination/termination:

Outgoing Minutes/day	15.00 Minutes
Incoming Minutes/day	15.15 Minutes

Break-up of the above:

Traffic minutes within the Exchange	2.60 Minutes
Total Inter-exchange & Intra_SDCA	18.00 Minutes
Total Inter-SDCA (1 TAX)	1.80 Minutes
Total Inter-SDCA (2 TAXs)	1.80 Minutes
Total Inter_LDCA (3 TAXs)	3.40 Minutes
Total Inter_LDCA (4 TAXs)	2.55 Minutes

5.22 The costs for the various long distance call categories in Schedule 6 were derived taking the unbundled network elements corresponding to the different types of calls covering one or more TAXs. In this case, the cost base includes both the capital cost as well as the operational costs. The per minute costs were derived based on the minutes of use for these different types of calls.

5.23 The cost based estimates derived using the above methodology need to be augmented to take account of the prescribed license fee (revenue share). A revenue share of 12 per cent is used for origination/termination, and 15 per cent for carriage of national long distance calls.

5.24 In addition, the IUC is a wholesale price and would include a margin over the cost. A mark up of 10 per cent was given for this purpose. With these elements, the cost based charges calculated in the framework of Schedule 6 (without

including access deficit) are shown in Annex IV. Corresponding to these cost estimates, the IUC for long distance calls have been considered for four different distance categories, which correspond to the present tariff structure for long distance calls prevailing in the market, which are distance based i.e. up to 50 kms, 50 to 200 kms, 200 to 500 kms, and above 500 kms. These estimates are shown in Table 5.3 below.

**Table 5.3 Average IUCs (including 10 % mark up and revenue share License Fee) For Origination, Carriage, and Termination For National Long Distance Calls (Rs./minute)**

<u>Distance Slab</u>	<u>Originating access</u>	<u>Carriage</u>	<u>Terminating access</u>	<u>Total IUC per minute</u>
1. <u>Upto 50 Kms.</u>	0.25	0.19	0.25	0.69
2. <u>50 to 200 Kms.</u>	0.25	0.35	0.25	0.85
3. <u>200 to 500 kms.</u>	0.25	0.81	0.25	1.31
4. <u>Above 500 Kms.</u>	0.25	0.99	0.25	1.49

5.25 To this amount, the estimate of access deficit and cost of free calls have been added. The charge due to access deficit (including revenue share License Fee) has been calculated at Rs. 0.97 per minute on account of rental, and Rs. 0.22 per minute to cover the cost of free calls. The cost of free call was taken on the basis of their being local calls, each local call having an average holding time of two minutes. The average holding time was derived from the traffic data available with the Authority.

5.26 Taking account of the above costs, the average IUC estimates come to those shown in table 5.4 below.

**Table 5.4. Average IUCs (including 10 % mark up and revenue share License Fee) For Origination, Carriage, and Termination For National Long Distance Calls, Plus Access Deficit For Origination and Termination (Rs./minute)**

<u>Distance Slab</u>	<u>Originating access</u>	<u>Carriage</u>	<u>Terminating access</u>	<u>Total IUC per minute</u>
<u>1. Upto 50 Kms.</u>	1.44	0.19	1.44	3.07
<u>2. 50 to 200 Kms.</u>	1.44	0.35	1.44	3.23
<u>3. 200 to 500 kms.</u>	1.44	0.81	1.44	3.69
<u>4. Above 500 Kms.</u>	1.44	0.99	1.44	3.87

5.27 The effect of Access Deficit on the estimates of IUCs for the two lower distance categories (i.e. up to 200 kms.) is evident since the present tariff for short distance trunk calls would be below cost, especially taking account of the access deficit that is to be obtained from the national long distance call charges. In a multi-operator multi-service scenario for origination, carriage and termination, two or more service providers are likely to be involved in completing a call necessitating a fair sharing of the call revenue. The present tariff structure is, however, such that the call charges for distances up to 200 kms i.e. in the first two of the four categories do not cover the estimated IUC. In the two higher distance categories, however, the charges are much higher. In the single operator scenario these high charges have traditionally covered the cost of lower distance calls, in other words subsidised them. A revenue structure such as this is based on the principle of affordability, it being the assumption that the consumers who make longer distance calls have higher levels of affordability. We may have to continue with this kind of tariff structure for some time more and keep long distance calls priced comparatively higher on considerations of affordability. In this context, it is also noteworthy that national long distance operators are likely to

carry inter-circle calls which would generally fall within the two higher distance categories i.e. above 200 Kms. In a multi-operator, multi-service scenario a methodology for sharing call revenues among the different players would need to be evolved which enables each of the participating service providers to recover its costs incurred in completing the call and also provides it with a reasonable return. The surplus needs to be divided in a manner so that all the operators involved can sustain their services and the telecom network can be extended rapidly over time.

**(d) Other issues**

5.28 To the extent that certain monthly rentals, e.g. Wireless in Local Loop with limited mobility (WLL (M)), have been fixed on a cost basis, the amount to be provided would not include any access deficit nor would it include the amount calculated for free calls, as no such calls are permitted.

5.29 The estimation of whether or not there is a surplus in the IUC regime would involve calculating a weighted average of the surplus/deficit for different distance categories. This would need information on the distribution of call minutes across these categories and on the peak and off peak call distribution under each of these distance categories. Table 5.5 gives this, based on the data discussed earlier in this Chapter. Information from BSNL indicates that the distribution of peak and off-peak metered call units is in the ratio of about 60:40.

**Table 5.5. Distribution of the Minutes Of Use Per day for the Different Categories of Long Distance Calls (incoming and outgoing)**

<b>Distance categories</b>	<b>Average Long Distance Minutes of Use Per Day</b>	<b>Percentage share in Total Average Long Distance Minutes of Use</b>
0 to 50 kms.	1.8	18.85%
50 to 200 kms.	1.8	18.85%
200 to 500 kms.	3.4	35.60%
Above 500 kms.*	2.55	26.71%

\* Includes 0.25 minutes on account of international traffic.

5.30 Where more than one long distance service provider is involved in carrying the calls, the revenues would need to be shared. This sharing may take place, for example, in the same proportion as the IUC shown in Schedule 6 given in Annex IV. Mutual negotiations will be another alternative but it would always be more desirable to decide upon any sharing pattern based on objective and verifiable data.

5.31 The Regulator may consider providing a range for IUC to facilitate negotiations. So long as the IUC quoted by the interconnection provider is within the given range the seeker may find it acceptable. By giving a range the Regulator could take care of the following concerns.

- a difference in the cost base in different conditions/places.
- the possibility of a change in the pattern of the Minutes of Usage that has been used for the underlying estimates.
- to provide a flexible basis for a negotiating framework since the actual IUCs are expected to be reached through a negotiated solution.
- provide a basis for giving different charges for national long distance call origination/termination in rural areas.
- provide buoyancy for competitive pricing to take place in the market.

5.32 If provisioning of a range for IUC by the Regulator is considered desirable the span of the range and the basis on which the range can be built will be an issue.

**5.33 Based on the discussion in this Chapter, the following questions are raised for consultations:**

- (a) Can the average estimates of IUC given in this Chapter form basis for introduction of a new IUC regime? If some changes are considered desirable what should these be and what should be the basis for effecting those changes in the given estimates?**
- (b) Is it desirable that the Regulator provides a range for the IUC within which the concerned service providers may conclude their negotiations at a mutually agreed point?**
- (c) Should the applicable IUC be relatively higher for rural and remote areas?**

- (d) Should there be linkage between long distance tariff and the IUC?**
- (e) It is proposed to use element based costing to work out the basic tariffs, i.e. rental and local as well as long distance call charges. What alternative methodologies for both or any of these can be considered as appropriate in the conditions currently prevailing in the Indian Telecom Sector? What, if any, will be the main advantage of such alternative methodology?**

**Annex Table I****Comparative Chart of Internet Telephony Rates by various Service Providers**

Sl. No.	Service provider	Rate per minute in Rs. (Range)						
		Calls to SAARC & other neighbouring countries	Calls to other Asian countries	Calls to European countries	Calls to Australian continent	Calls to African Countries	Calls to North American countries	Calls to south American countries (central America)
<b>TRAI ISD call rates</b>		<b>21.60</b>	<b>32.40</b>	<b>32.40</b>	<b>32.40</b>	<b>32.40</b>	<b>40.80</b>	<b>40.80</b>
<b>Existing ISD tariffs – Peak</b>		<b>21.60</b>	<b>24</b>	<b>24</b>	<b>24</b>	<b>24</b>	<b>24</b>	<b>24</b>
<b>Off Peak</b>		<b>18.00</b>	<b>21.60</b>	<b>21.60</b>	<b>21.60</b>	<b>21.60</b>	<b>21.60</b>	<b>21.60</b>
1.	A	25 – 77.52	8 – 74.45	5 – 30 U.K.- 5	5 – 8	20 – 53.67	5 – 15 USA – 5 Canada – 5	8 – 50.14
2.	B	31.36 – 99.50	7.37 – 229.11	3.05–36.55 U.K.- 5.39 London - 4.3	6.4 – 8.81	23.27 – 146.08	4.95 – 5.86 USA– 4.95 Canada– 5.19	8.02 - 209.48
3.	C	48.20 – 58.70	5 – 90.40	5 – 21.70 U.K. – 5	5	21.70- 75.50	5 USA - 5 Canada – 5	5- 87.60
4.	D	12 -30	12.00 – 273.24	9.90 – 30.74 U.K. – 8	13.10	16.17– 92.58	8 USA – 8	10.73 – 297.61
5.	E	19.95 – 40.50	3.50 – 78.68	2.50 – 16.50 U.K. – 5	3-15	13.60 – 52.13	2.50 USA - 2. 5 Canada - 2.5	10.58 – 46.50
6.	F	66.92- 117.37	7.21 – 227.03	4.38 – 45.04 U.K.– 5.28	9.00 (Australia)	25.23 – 95.24	4.49– 6.44 USA- 4.49 Canada - 4.62	14.41 – 79.28
7.	G	49.60- 88.23	9.61- 224.61	5.06-37.12 U.K. – 6.24	7.73 - 8.51	22.27- 143.77	5.21 – 10.36 USA – 5.21 Canada – 5.79	10.54 – 205.52

Sl. No.	Service provider	Rate per minute in Rs. (Range)						
		Calls to SAARC & other neighbouring countries	Calls to other Asian countries	Calls to European countries	Calls to Australian continent	Calls to African Countries	Calls to North American countries	Calls to south American countries (central America)
8.	H	20 18	29 26	29 26	29 26	29 26	37 33	37 33
9.	I	N.A.	4.25-8.00 (China, Japan, Hongkong, Singapore, Taiwan)	4.25 (Belgium, Denmark, France, Germany, Italy, Sweden, UK)	4.25 (Australia)	N.A.	4.25 (USA and Canada)	N.A.
10.	J	N.A.	5.95 – 19.95	5.95-7.95 U.K.- 5.95	7.95	N.A.	5.95-7.95 USA – 5.95 Canada – 7.95	N.A.
11.	K	18	Asia pacific - 11  Middle East – 18  Others- 25	6	11	25	6	25
12.	L	N.A.	7 - 13	7 – 10 U.K. – 7	7	13 (South Africa and Zimbabwe)	7 – 10 USA – 7 Canada – 7	7- 16
13	M	20	8 – 22	4.8 – 18 U.K. – 4.8	4.8 – 8	18 – 22	4.8 USA – 4.8 Canada – 4.8	12 - 22



Sl. No.	Service provider	Rate per minute in Rs. (Range)						
		Calls to SAARC & other neighbouring countries	Calls to other Asian countries	Calls to European countries	Calls to Australian continent	Calls to African Countries	Calls to North American countries	Calls to south American countries (central America)
14.	N	14 (Dhaka)	4.5 – 19	4.5 – 17 4.5 – U.K.	6	10 – 21	4.5 – 7 4.5 – USA 4.5 – Canada	6 - 20

Source: Tariff Submissions to TRAI

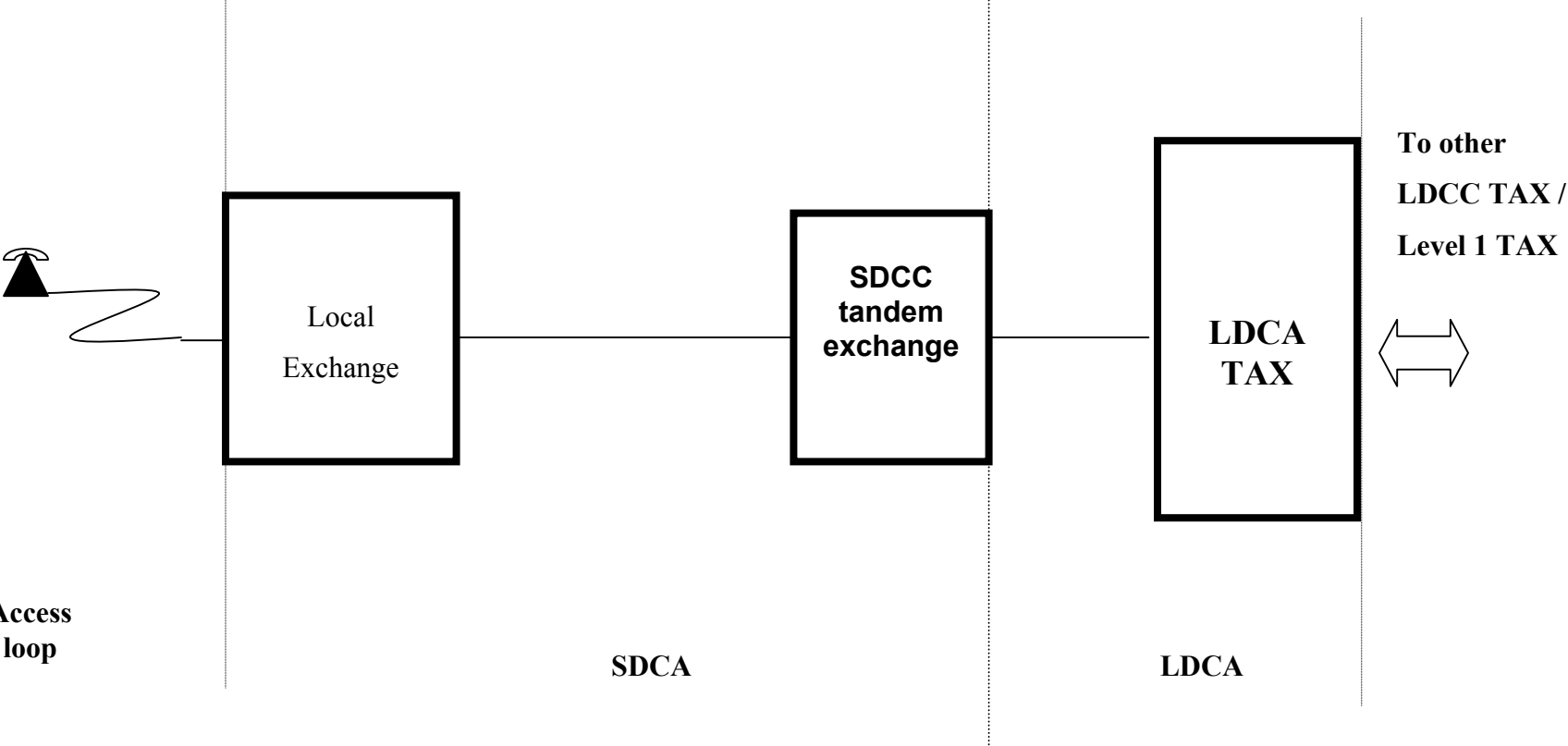
**Annex Table II**      **List of Amendments to TTO, 1999 related to Basic Tariff.**

Sl.No.	Name of the Order	Date of Issue	Main Objective
1.	The Telecommunication Tariff (First Amendment) Order , 1999	30.3.1999	To postpone the date of implementation of new tariff in respect of Schedule I, II and IV of TTO, 1999 from 1.4.1999 to 1.5.1999.
2.	The Telecommunication Tariff (Second Amendment) Order, 1999	31.5.1999	To clarify coverage of certain tariff and also to address misprints in TTO,1999.
3.	The Telecommunication Tariff (Third Amendment) Order, 1999	31.5.1999	To allow Basic service Providers the flexibility of providing alternate tariff packages.
4.	The Telecommunication Tariff (Sixth Amendment) Order, 1999	30.9.1999	A new tariff category titled 'Centrex' was added.
5.	The Telecommunication Tariff (Seventh Amendment) Order, 2000	30.3.2000	To postpone the date of implementation of 2 <sup>nd</sup> phase of tariff rebalancing by four months i.e. up to 31.7.2000.
6.	The Telecommunication Tariff (Eighth Amendment) Order, 2000	31.7.2000	To post pone the date of implementation of 2 <sup>nd</sup> phase of tariff rebalancing by another one month i.e. up to 31.8.2000.
7.	The Telecommunication Tariff (Ninth Amendment) Order, 2000	28.8.2000	To introduce 2 <sup>nd</sup> phase of tariff change w.e.f.1.10.2000.
8.	The Telecommunication Tariff (Tenth Amendment) Order, 2000	9.11.2000	Tariff for extension users of DID Franchisees was revised.
9.	The Telecommunication Tariff (Eleventh Amendment) Order, 2001	25.1.2001	To enlarge the scope of BSNL's revised pulse rates for distance categories 50-200 Kms in respect of inter-network calls also.  This has been set aside by TDSAT

10.	The Telecommunication Tariff (Fourteenth Amendment) Order, 2001	24.5.2001	Tariff for Limited Mobility (WLL) Service.
11.	The Telecommunication Tariff (Fifteenth Amendment) Order, 2001	20.7.2001	To enlarge the scope of BSNL's revised pulse rates for distance categories 50-200 Kms in respect of inter-network calls also.
12.	The Telecommunication Tariff (Seventeenth Amendment) Order, 2002.	22.1.2002	Regarding Reporting Requirement for filing of tariff proposals by the service providers.
13.	The Telecommunication Tariff (Twentieth Amendment) Order, 2002	14.3.2002	Implementation of third tranche tariff.
14.	The Telecommunication Tariff (Twenty First Amendment) Order, 2002	13.6.02	To review the reporting requirement for filing of tariff plans by service providers.
15.	The Telecommunication Tariff (Twenty Second Amendment) Order, 2002	4.7.02	Revision of tariff for Limited Mobility (WLL) Service.

**Formats  
for  
Unbundling of Cost of  
Network Elements**

PSTN Network Topology



## A. Access Loop from Customer Premises to Local Exchange

### 1. Customer Premises

Elements of Cost	Upto 200 lines	200 to 1.5 k Lines	1.5k to 10k Lines	10k to 30k Lines	30 k to 1 lakh Lines	More than 1 lakh Lines
Customer Premises Equipment i.e., Telephone set						
Internal wiring						

### 2. User Network Interface (UNI) to Service Node Interface (SNI)\*

Elements of Cost	Upto 200 lines	200 to 1.5 k Lines	1.5k to 10k Lines	10k to 30k Lines	30 k to 1 lakh Lines	More than 1 lakh Lines
Lines & wires						
Distribution Point (DP)						
Pillar / cabinet						
UG Cable						
Cable laying						
Cable Jointing and Termination						
Installation Cost						

### 3. Local Exchange

Elements of Cost	Upto 200 lines	200 to 1.5 k Lines	1.5k to 10k Lines	10k to 30k Lines	30 k to 1 lakh Lines	More than 1 lakh Lines
MDF						
Line Card						
Land & Building						

### Assumptions

1. Average access loop distance from Customer Premises (UNI) to Local Exchange (SNI) to be taken as 4 Km for Urban areas and 6 Kms for Rural areas.
2. For Hilly area, the distance is to be taken as 8 Kms for upto 500 line exchanges.
3. A fill factor for Cable utilization can be taken into account. It could be 80% for Urban Areas and 50% for Rural areas.
4. Mix of New Technology and C-DOT exchanges (20:80 for local area having capacity less than 30 k lines, 50:50 for local area having capacity between 30 k to 1 lakh and 80:20 for local area having more than 1 lakh capacity).
5. In Rural area, exchange upto 1400 lines SBM can be taken. Presently Rural exchange areas below 200 lines can be served by CDOT 256 P exchanges.

**B. Local exchange to SDCC tandem link**

**1. Local Exchange (except line card and MDF)**

Elements of Cost	Upto 200 lines	200 to 1.5 k Lines	1.5k to 10k Lines	10k to 30k Lines	30 k to 1 lakh Lines	More than 1 lakh Lines
Local Exchange (except line card, MDF and Digital Trunk Interface for Long Distance )						

**2. Transmission Link (Optical Fibre) related cost elements (variable with distance)**

Elements of Cost	Upto 2 Mb	2 Mb to 8 Mb	8 Mb to 34 Mb
Optical Fibre cable including ducts, laying, trenching and backfilling			
Route Survey			
Right of way			
Project Management and coordination			

## 2.A Cost related to Terminal equipment (Fixed cost)

Elements of Cost	Upto 2 Mb	2 Mb to 8 Mb	8 Mb to 34 Mb
Terminal equipment (8 Mbps Optimux including DDF)			
Spares			
Power Plant			
Battery			
Engine Alternator			
Electrical Items			
Test Instruments			
Earthing			
Air-conditioning			
Digital Trunk Interface at Local and SDCC Tandem Exchanges			

### Assumptions:

- Given that LE to SDCC average distance is "X" Kms, it can be assumed that out of "X" Kms, 10 Kms is within municipal limits. Out of the 10 Km within municipal limits, GI pipes can be assumed in 3 Km length and in balance 7 Kms half round RCC pipe can be assumed. This is in addition to the HDPE Pipe normally used for OFC. Beyond the Municipal area, only HDPE Pipe may be assumed for OFC.
- Rocky: Plan area, ratio varies from circle to circle.



**C. SDCC Tandem**

	SDCC Tandem requirements for a switching capacity in the SDCA Network of Capacity			
Elements of Cost	Upto 1.5 k Lines	1.5k to 10k Lines	10k to 30k Lines	30 k to 1 lakh Lines
Tandem Exchange (except Digital Trunk Interface) per circuit termination in Tandem.				

**D. SDCC to LDCC link (as apportioned on per DEL basis)**

**1. Transmission Link (Optical Fibre) related cost elements (variable with distance)**

Elements of Cost	Upto 8 Mb	Upto 34 Mb	Upto 140 Mb	STM 1
Optical Fibre cable including ducts, laying, trenching and backfilling				
Route Survey				
Right of way				
Project Management and coordination				

**2. Cost related to Terminal equipment (Fixed cost)**

Elements of Cost	Upto 8 Mb	Upto 34 Mb	Upto 140 Mb	STM 1
Terminal equipment (STM1 or 8/34/140 Mbps Optimux)				
Line Control Terminal (in case of STM1)				
Spares				
Network Manager (in case of STM1)				
Digital Distribution Frame				
Power Plant				
Battery				
Engine Alternator				
Electrical Items				
Test Instruments				
Earthing				
Air-conditioning				
Digital Trunk Interface at Local and SDCC Tandem Exchanges				

**Regenerator cost (every 40 Km)**

Elements of Cost	Upto 8 Mb	Upto 34 Mb	Upto 140 Mb	STM 1
Regenerator equipment (STM1 or 34 Mbps Optimux)				
Spares				
Power Plant				
Battery				
Engine Alternator				
Electrical Items				
Earthing				
Air-conditioning				

**LDCC TAX**

Elements of Cost	Upto 1000 lines	> 1k and upto 5 k Lines	> 6 k and upto 20 k Lines	20 k to 50k Lines	Above 50 k Lines
Trunk Automatic Exchange (except Digital Trunk Interface) Cost per line of TAX equipment					

**Assumptions**

1. Given that SDCC to LDCC average distance is "X" Kms, it can be assumed that out of "X" Kms, 10 Kms is within municipal limits. Out of the 10 Km within municipal limits, GI pipes can be assumed in 3 Km length and in balance 7 Kms half round RCC pipe can be assumed. This is in addition to the HDPE Pipe normally used for OFC. Beyond the Municipal area, only HDPE Pipe may be assumed for OFC.
2. Rocky: Plan area, ratio varies from circle to circle.

**E. LDCC to LDCC link**

**1. Transmission Link (Optical Fibre) related cost elements (variable with distance)**

Elements of Cost	565 Mb lines	140 Mb Lines	STM Lines	4	STM Lines	16
Optical Fibre cable including ducts, laying, trenching and backfilling						
Route Survey						
Right of way						
Project Management and coordination						

**2. Cost related to Terminal equipment (Fixed cost)**

Elements of Cost	565 Mb lines	140 Mb Lines	STM Lines	4	STM Lines	16
Terminal equipment (STM4/16 or 140/565 Mbps Optimux)						
Line Control Terminal (in case of STM16)						
Spares						
Network Manager (in case of STM16)						
Digital Distribution Frame						
Power Plant						
Battery						
Engine Alternator						
Electrical Items						
Test Instruments						
Earthing						
Air-conditioning						
Digital Trunk Interface at Local and SDCC Tandem Exchanges						

**Regenerator cost (every 40 Km)**

Elements of Cost	565 Mb lines	140 Mb Lines	STM 4 Lines	STM 16 Lines
Regenerator equipment (STM16 or 140 Mbps Optimux)				
Spares				
Power Plant				
Battery				
Engine Alternator				
Electrical Items				
Earthing				
Air-conditioning				

**Assumptions**

- Given that LDCC to LDCC average distance is "X" Kms, it can be assumed that out of "X" Kms, 10 Kms is within municipal limits. Out of the 10 Km within municipal limits, GI pipes can be assumed in 3 Km length and in balance 7 Kms half round RCC pipe can be assumed. This is in addition to the HDPE Pipe normally used for OFC. Beyond the Municipal area, only HDPE Pipe may be assumed for OFC.
- 
- Rocky: Plan area, ratio varies from circle to circle.

## TRAFFIC SENSITIVE INPUTS

### BSNL to provide data for all Circles and other BSOs for their licensed Service Area

I. Number of Metered Calls within a representative SDCA for 1000 DELs (Atleast 2 SDCAs to be covered in each Circle)

Circle	First SDCA	Second SDCA

II. Number of metered calls in the Intra-Circle Network for the following slabs for 1000 DELs (At least one Level I and two Level II TAX stations in each Circle to be covered).

Slab Distance	Metered Calls		
	Level I	Level II	Level II
Upto 50 Kms			
51 to 200 Kms			
201 to 500 Kms			
501 to 1000 Kms			
Above 1000 Kms			

III. Number of metered calls in the Inter-Circle Network for the following slabs for 1000 DELs

Slab Distance	Metered Calls
Upto 50 Kms	
51 to 200 Kms	
201 to 500 Kms	
501 to 1000 Kms	
Above 1000 Kms	

## FORMAT FOR DATA REQUIRED FROM BASIC OPERATORS

Note: Explanations for terms are at the end of the Table

	Actuals			Latest Projections		
	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04
<b>1. NETWORK CAPACITY (DELs)</b>						
Equipped Capacity						
Number of Working DELs						
<b>2. NUMBER OF SUBSCRIBERS</b>						
Opening Subscribers						
Closing Subscribers						
Average Subscribers						
<b>3. CAPACITY UTILISATION (%)</b>						
Subscriber						
<b>4. SOURCES OF FUNDS</b>						
Debt (Rs. Lakhs)						
Equity						
Others (Please specify)						
<b>5. Slab-wise Tariffs</b>						
<b>Peak hours</b>						
0 to 50 Kms						
>50 to 100 Kms						
>100 to 200 Kms						
>200 to 500 Kms						
>500 to 1000 Kms						
> 1000 Kms						
<b>Off-Peak hours</b>						
0 to 50 Kms						
>50 to 100 Kms						
>100 to 200 Kms						
>200 to 500 Kms						
>500 to 1000 Kms						
> 1000 Kms						
<b>6. REVENUE (Rs. Lakhs)</b>						
Rental Revenue						
Call Revenue						
Installation Fee						
STD & ISD Revenue						
Revenue from supplementary and value added services						
Revenue from Pass Thru from Basic						
Revenue from Pass Thru from Cellular						
Anyother Revenue (please specify)						
ARPU (Rs.)						

	Actuals			Latest Projections		
	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04
<b>7. BASIC Service (including WLL)</b>						
No. of subscribers in Standard Package(STP)						
No. of ATPs filed with TRAI						
No. of ATPs on offer.						
Total No. of subscribers.						
Total MCUs (local/long distance/ international calls.						
Average Revenue per user (ARPU)						
Total revenue (Rentals+Call Revenue+Others.)						
<b>8. Wireless in Local Loop (Fixed) [WLL(F)]</b>						
No. of subscribers in Standard Package.						
No. of plans filed with TRAI						
No. of plans on offer.						
Total No. of subscribers.						
No. of MCUs						
Average Revenue per user (ARPU)						
No. of waitlisted subscribers.						
Total revenue (Rentals+Call Revenue+Others.)						
<b>9. Wireless in Local Loop (Mobile) [WLL(M)]</b>						
No. of subscribers.						
Total MCUs						
Average Revenue per user.						
Pass through revenue in the ratio 5:95						
Total revenue (Rentals+Call Revenue+Others.)						
<b>10. Public Call Offices (PCOs)</b>						
No. of ATPs filed for PCOs						
No. of ATPs on offer.						
No. of PCOs installed						
Average Revenue per PCO.						
No. of pending applications for PCOs.						



	Actuals			Latest Projections		
	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04
<b>11. Village Panchayat Telephones (VPTs)</b>						
No. of VPTs installed.						
Average revenue from VPTs						
No. of pending applications for VPTs						
<b>12. Coin Collection Boxes (CCBs).</b>						
No. of CCBs installed.						
Average revenue from CCBs						
No. of pending applications for CCBs						
<b>13. DID/Centrex</b>						
No. of tariff plans filed for DID/Centrex.						
No. of franchisees/subscribers/service providers owned DID EPABXs.						
Average revenue per extension user.						
<b>14. Value Added Service (VAS)</b>						
Total number of VASs offered. Provide details						
Details of tariff plans on offer (to be appended).						
<b>15. CAPITAL EXPENDITURE (Rs.lakhs)</b>						
Network Setup Costs						
Network Expansion Costs						
Preoperative Expenses as Capitalised						
Shared assets if any(% of its utilisation attributable to this network)						
License fee capitalised						
Others (Please specify)						
<b>16. REAL ESTATE COSTS (Rs. Lakhs)</b>						
Company Owned Premises-Capital Expen.						
Leased Premises-Annual Lease Rent						
Shared assets if any(% of its utilisation attributable to this network)						
Others (Please specify)						
<b>17. LICENCE FEE (Rs. Lakhs)</b>						
Penalties paid (if any)						
Others (Please specify)						
<b>18. PSTN PASS THROUGH CHARGES (Rs. Lakhs)</b>						

	Actuals			Latest Projections		
	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04
<b>19. OPERATING COST AS PER P&amp;L ACCOUNT (Rs. Lakhs)</b>						
Salary, wages and other allowances #						
Non salary expenses #						
Human Resources development - Recruitment, training etc.						
Network Management/Network Maintenance						
Directory and operator services						
Rent of buildings #						
Insurance #						
Service Tax						
Electricity and Fuel charges #						
- Office #						
- Network Equipment						
Repair and Maintenance						
- Plant and Machinery						
- Office premises #						
- Vehicles #						
- Others (please specify) #						
Spare inventory						
Telephone charges						
Printing and stationery #						
Postage #						
Travel Expenses #						
Freight #						
Billing and customer care						
Business promotion and marketing, exhibitions #						
Bad debts						
Licence Fee						
Interconnection charges						
- Port charges						
- Leased line charges						
- other interconnection charges						
Meetings/Entertainment #						
Other operating Expenses (Please specify)						
<b>20. PREPAID OVER THE COUNTER</b>						
<b>VCC / ITC CARDS</b>						
Number sold						
Value (Rs. Lakhs)						
Other Income (please specify sub heads)						
<b>21. INTEREST # (Rs. Lakhs)</b>						

	Actuals			Latest Projections		
	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04
<b>22. DEPRECIATION # (Rs. Lakhs)</b>						
<b>23. PROFIT BEFORE TAX</b>						
<b>24. PROFIT AFTER TAX</b>						
<b>NET PROFIT(Rs. Lakhs)</b>						
<b>25. MARKET SHARE</b>						
<b>(% in area of operation)</b>						

**Explanatory Notes:**

1. Closing capacity refers to the capacity at the end of the accounting period
2. ARPU is the average revenue per user per year. Please specify the elements of revenue included in the calculation of ARPU.

**Annex Table -IV Framework of Schedule 5 and the cost based average estimates for IUC (without access deficit) as per Schedule 6 of the model Reference interconnect offer**

**SCHEDULE 5**

**Interconnect Usage charges (IUC) for use of Unbundled Network Elements (UNEs) involved in carriage of various types of calls**

No.	Network Elements	Total OPEX per DEL	Mean Capital Employed per DEL	Cost of Capital (%)	Annual CAPEX	Annual CAPEX+OP EX per DEL	Minutes of Usage	Av. Cost per minute
1.	Wireline/ Wireless Access Loop							
2.	Local Exchange							
3.	SDCC Tandem							
4.	TAX Switch							
5.	Local Exchange – SDCC transmission Link							
6.	Local Exchange – SDCC transmission Length in steps of 1 km each.							
7.	SDCC – TAX transmission Link							
8.	SDCC – TAX transmission Length in steps of 10 km each.							
9.	Inter-TAX transmission Link (Intra-Circle)							
10.	Inter-TAX Transmission Length (Intra-Circle) in steps of 50 km each.							
11.	Inter-TAX transmission Link (Inter-Circle)							
12.	Inter-TAX Transmission Length (Inter-Circle) in steps of 50 km each.							

**NOTES:**

1. **Based on the above average cost per minute/per unit indicated in the table, it should be possible to calculate carriage/ access charges involving various types of switching and transmission elements such as Double TAX call for transit, Single TAX/ILT call for originating and termination.**
2. The element costs may be different for different network sizes/ configurations.
3. This Schedule shall be submitted by both the Parties to the Authority and will be treated as confidential.

**SCHEDULE 6**  
**Interconnect Usage Charges Derived From Schedule 5**  
(Rs.; includes a 10 per cent mark up and revenue share License Fee)

<b>Type of Access / Carriage</b>	<b>Network Elements involved</b>	<b>Charge / Minute</b>
Originating	Local Loop-Local Exchange-Tandem Exchange plus Transmission Link & Length	0.25
Transit	Single TAX-Transmission Link & Length (Intra-Circle)	0.19
Transit	Two TAXs-Transmission Link & Length (Intra-Circle and Inter-Circle)	0.35
Transit	Three TAXs-Transmission Link & Length (Intra-Circle and Inter-Circle)	0.81
Transit	Four TAXs – Transmission Link & Length (Inter-Circle)	0.99
Terminating	Tandem exchange plus Transmission Link & Length – Local Exchange – Local Loop	0.25

## **ANEXO 3**

24th Amendment to Telecommunications Tariff Order, 1999 dated January 24, 2003 (the “TT Order”).

<http://www.trai.gov.in/torders.htm>

**Telecom Regulatory Authority of India**  
**Notification**

New Delhi , the 24<sup>th</sup> January, 2003

No. 306-2/2003-Econ

In exercise of the powers conferred upon it under sub-section (2) of section 11 of the Telecom Regulatory Authority of India Act, 1997 as amended by TRAI (Amendment) Act, 2000, the Telecom Regulatory Authority of India (TRAI) hereby makes the following order by an amendment to the Telecommunication Tariff Order, 1999 by notification in the Official Gazette, in respect of tariffs at which Telecommunication Services within India and outside India shall be provided :

**The Telecommunication Tariff (Twenty Fourth Amendment) Order 2003  
(1 of 2003)**

**Section I**

**Title, Extent and Commencement**

1. Short title, extent and commencement:
  - (i) This Order shall be called “The Telecommunication Tariff (Twenty Fourth Amendment) Order 2003”.
  - (ii) The Order shall come into force on the date of its notification in the Official Gazette.

**Section II**

**Tariffs for Telecommunication Services**

**2 Tariffs**

Tariffs as contained in Schedules I and II under Section III of the Telecommunication Tariff Order 1999 shall stand deleted and substituted as specified in the Schedules I and II hereto.

### Section III

#### **3. Explanatory Memorandum**

This Order contains at Annex A, an explanatory memorandum to provide clarity and transparency to the tariffs specified in this Order.

BY ORDER

Dr. Harsha Vardhana Singh,  
Secretary cum Principal Advisor,  
Telecom Regulatory Authority of India



**Schedule I**

**Basic Services (Other than ISDN)**

ITEM	TARIFF
<b><u>(1) Date of Implementation</u></b>	1 April, 2003
<b><u>(2) Registration Charges</u></b>	Prevailing charges as on the date of this Order as ceilings
<b>(3) Installation Charges</b>  <b>(3.a) Fixed line telephony service using other than wireless in local loop technology</b>  <b>(3.b) Fixed line telephony service using wireless in local loop technology (Fixed and Limited Mobility)</b>	  Prevailing charges as on the date of this Order as ceilings   Forbearance
<b><u>(4) Deposits</u></b>  <b>(4.a) Fixed line telephony service using other than wireless in local loop technology</b>  <b>(4.b) Fixed line telephony service using wireless in local loop technology (Fixed)</b>	  Not to exceed twelve month's rentals as specified from time to time   Forbearance <u>Provided that,</u> The maximum period for deposit higher than at (4.a) above (i.e. higher than for fixed line telephony other than using wireless in local loop) is one year. At the end of one year of obtaining a wireless in local loop connection, unless the subscriber specifically demands the continuation of that connection on wireless in local loop, the additional deposit involved shall be refunded to the subscriber or interest paid on such additional deposit at the annual rate of interest for one year deposits prescribed by the State Bank of India.

<p><b>(4.c) Limited Mobility telephony service using wireless in local loop technology</b></p>	<p>Forbearance</p>		
<p><b>(4.d) Handset for Limited Mobility telephony service using wireless in local loop technology if provided by service provider</b></p>	<p>Forbearance</p>		
<p><b><u>(5) Monthly Rentals For Rural Subscribers</u></b></p>			
<p><b>(5.a) Fixed line telephony service including wireless in local loop technology (Fixed)</b></p>	<p><b>Capacity of local Exchange System (Number of Lines)</b></p> <p>-----</p> <p>Up to 999 1,000 to 29,999 30,000 to 99,999 1 lakh and above</p>	<p><b>Senior Citizen (Rs)</b></p> <p>-----</p> <p>70 120 180 250</p>	<p><b>Others (Rs.)</b></p> <p>-----</p> <p>70 120 200 280</p> <p>Note: The definition of Senior Citizen shall be the same as for the purpose of payment of Income Tax.</p>
<p><b>(5.b) For Limited Mobility telephony service using wireless in local loop technology</b></p>	<p>Rs.200 per month</p>		
<p><b>(5.c) For Limited Mobility telephony service using wireless in local loop technology if handset provided by service provider, without a deposit as stipulated in (4.d) above</b></p>	<p>As in (5.b) above Plus Ceiling of Rs.50.00 per month. This ceiling applies to all other amounts including, for example, depreciation and insurance premium, but excluding deposits.</p>		

	<p><u>Notes:</u></p> <p>(1) Rural subscribers are those who reside in a rural SDCA as specified in the new Basic Service Licenses.</p> <p>(2) Capacity of the Local Exchange system is the sum of the capacities of all exchanges in a local area. Any augmentation of the local exchange capacity after the date of implementation of this Order shall automatically be taken into account for re-classification for purposes of tariffs.</p> <p>(3) Short Distance Charging Area (SDCA) is one of the 2647 Local Areas whose details are provided in the Basic Service Licenses and also in the Numbering Plan wherein for each SDCA, a unique STD code is provided. Local call charges are applicable on Intra-SDCA traffic and for calls within the distance category “0 to 50 kms.”.</p>
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<b><u>(6) Monthly Rentals For Urban (Residential) Subscribers</u></b>			
<b>(6.a) Fixed line telephony service including wireless in local loop technology (Fixed)</b>	<b>Capacity of local Exchange System (Number of Lines)</b>	<b>Senior Citizen (Rs)</b>	<b>Others (Rs.)</b>
	-----	-----	-----
	Up to 29,999	120	120
	30,000 to 99,999	180	200
	1 lakh and above	250	280
	Note: The definition of Senior Citizen shall be the same as for the purpose of payment of Income Tax.		
<b>(6.b) For Limited Mobility telephony service using wireless in local loop technology</b>	Rs. 200 per month		
<b>(6.c) For Limited Mobility telephony service using wireless in local loop technology if handset provided by service provider, without a deposit as stipulated in (4.d) above</b>	As in (6.b) above Plus Ceiling of Rs.50.00 per month. This ceiling applies to all other amounts including, for example, depreciation and insurance premium, but excluding deposits.		
	<u>Notes:</u>		
	(1) Urban subscribers are those who reside in Semi-Urban or Urban SDCAs as specified in the new Basic Service Licenses.		
	(2) Capacity of the Local Exchange system is the sum of the capacities of all exchanges in a local area.		

<p><b><u>(7) Monthly Rentals For Commercial Subscribers in Urban Areas</u></b></p>	<p><b>Capacity of local Exchange System (Number of Lines) (Rs)</b></p> <hr/> <table> <tr> <td>30,000 to 99,999</td> <td>220</td> </tr> <tr> <td>1 lakh and above</td> <td>310</td> </tr> </table>		30,000 to 99,999	220	1 lakh and above	310
30,000 to 99,999	220					
1 lakh and above	310					
<p><b>(7.a) Fixed line telephony service including wireless in local loop technology (Fixed)</b></p>	<p>Rs. 200 per month</p> <p><u>Notes:</u>  (1) "Commercial user subscribers" shall mean and include a person and/or an establishment carrying on any trade, business or profession or any work in connection with or incidental or ancillary thereto.  (2) Commercial monthly rentals are not specified separately for the lower exchange capacities.</p>					
<p><b><u>(8) Tariff per metered call for rural subscribers</u></b></p>	<table> <thead> <tr> <th data-bbox="500 1915 974 2074"> <b>First 300 Metered calls per Month of the billing cycle (except for free calls)</b>  (Rs.) </th> <th data-bbox="974 1915 1490 2074"> <b>Metered calls in excess of the first 300 metered calls per month of the billing cycle</b>  (Rs.) </th> </tr> </thead> <tbody> <tr> <td><hr/>0.80</td> <td><hr/>1.20</td> </tr> </tbody> </table> <p><b>(8.a) Fixed line telephony service including wireless in local loop technology (Fixed)</b></p> <p><b>(8.b) For Limited Mobility telephony service using wireless in local loop technology</b></p> <p>Forbearance subject to no charge for incoming calls</p>		<b>First 300 Metered calls per Month of the billing cycle (except for free calls)</b>  (Rs.)	<b>Metered calls in excess of the first 300 metered calls per month of the billing cycle</b>  (Rs.)	<hr/> 0.80	<hr/> 1.20
<b>First 300 Metered calls per Month of the billing cycle (except for free calls)</b>  (Rs.)	<b>Metered calls in excess of the first 300 metered calls per month of the billing cycle</b>  (Rs.)					
<hr/> 0.80	<hr/> 1.20					

<p><b><u>(9) Free calls (or uncharged calls) for rural subscribers</u></b></p> <p><b>(9.a) Fixed line telephony service including wireless in local loop technology (Fixed)</b></p> <p><b>(9.b) For Limited Mobility telephony service using wireless in local loop technology</b></p>	<p>50 metered call units per month of a billing cycle</p> <p>No free calls shall be provided</p>								
<p><b><u>(10) Tariff per metered call for urban subscribers</u></b></p> <p><b>(10.a) Fixed line telephony service including wireless in local loop technology (Fixed)</b></p> <p><b>(10.b) For Limited Mobility telephony service using wireless in local loop technology</b></p>	<table border="0" style="width: 100%;"> <tr> <td style="width: 50%; text-align: center;"><b>First 300 Metered calls per Month of the billing cycle (except for free calls)</b></td> <td style="width: 50%; text-align: center;"><b>Metered calls in excess of the first 300 metered calls per month of the billing cycle</b></td> </tr> <tr> <td style="text-align: center;">(Rs.)</td> <td style="text-align: center;">(Rs.)</td> </tr> <tr> <td style="text-align: center;">-----</td> <td style="text-align: center;">-----</td> </tr> <tr> <td style="text-align: center;">1.00</td> <td style="text-align: center;">1.20</td> </tr> </table> <p>Forbearance subject to no charge for incoming calls</p>	<b>First 300 Metered calls per Month of the billing cycle (except for free calls)</b>	<b>Metered calls in excess of the first 300 metered calls per month of the billing cycle</b>	(Rs.)	(Rs.)	-----	-----	1.00	1.20
<b>First 300 Metered calls per Month of the billing cycle (except for free calls)</b>	<b>Metered calls in excess of the first 300 metered calls per month of the billing cycle</b>								
(Rs.)	(Rs.)								
-----	-----								
1.00	1.20								

<p><b><u>(11) Free calls (or uncharged calls) for urban subscribers</u></b></p> <p><b>(11.a) Fixed line telephony service including wireless in local loop technology (Fixed)</b></p> <p><b>(11.b) For Limited Mobility telephony service using wireless in local loop technology</b></p>	<p>30 metered call units per month of a billing cycle.</p> <p>No free calls shall be provided</p>
<p><b><u>(12) Pulse Rate for local calls</u></b></p>	<p>120 seconds</p>
<p><b>(13) Domestic Long Distance Tariffs for peak hours</b></p> <p><b>(13.a) For Intra-Circle calls</b></p>	<p><b>Radial distance between the long distance charging centres as applicable</b> (Rs. )</p> <p>-----</p> <p>Up to 50 kms. Same as local call charge</p> <p>Distance Categories Above 50 kms. Forbearance subject to a ceiling of Rs. 8.40 per minute</p>

<p><b>(13.b) For Inter-Circle calls</b></p>	<p><b>Radial distance between the long distance charging centres as applicable</b> (Rs.)</p> <p>-----</p> <p>Up to 50 kms. Same as Local Call charge</p> <p>Distance Categories Above 50 kms. Forbearance subject to a ceiling of Rs. 8.40 per minute</p>
	<p><u>Notes:</u></p> <p>(1) Charging centres are classified as "Long Distance Charging Centre" (LDCC) and "Short Distance Charging Centre" (SDCC).</p> <p>(2) Charging Centre shall be the SDCCs in case of Long Distance Calls between adjacent LDCAs and within the same LDCA.</p> <p>(3) Charging Centre shall be the LDCCs in case of Long Distance Calls between non-adjacent LDCAs</p> <p>(4) Long Distance Charging Centre is a particular Trunk Automatic Exchange (TAX) in a long distance charging area as presently defined for the purpose of charging for Long Distance calls. Headquarters of a Secondary Switching Area are generally LDCCs.</p> <p>(5) Short Distance Charging Centre is a particular exchange in short distance charging area as presently defined for the purpose of charging trunk calls. Headquarters of Short Distance Charging Areas are generally SDCCs.</p> <p>(6) Country is divided into 322 Secondary Switching Area (SSA) as per the National Switching and Routing plans. It is a territory, whose boundary, generally but not necessarily, is co-terminus with those of one or more revenue Districts.</p> <p>(7) The Authority expects that tariffs for lower distance categories to be substantially below the ceiling.</p> <p>(8) The Interconnection usage charge should be paid by one operator to another as specified in the Interconnection Usage Charge (IUC) Regulation.</p>
<p><b>(14) <u>Inter-national Subscriber Dialed calls</u></b></p>	<p>Forbearance</p>



<p><b>(15) Calls to Cellular Mobile</b></p> <p><b>(15.i) In Metros</b></p>	<p>Call charge of Rs. 1.20 per 90 seconds for calls from Fixed line to Cellular Mobile</p> <p>Tariff forbearance for calls from WLL (M)</p>
<p><b>(15.ii) In Circles</b></p>	<p>Call charge of Rs. 1.20 per 60 seconds for call from fixed line to cellular mobile</p> <p>Tariff forbearance for calls from WLL (M)</p>

<b><u>(16 PCOs/VPTs)</u></b>	
<b>(16.a) Coin Collection Boxes (CCBs)</b>	
<b>(16.a.i) Tariff in rural areas</b>	Re. 1.00 per metered call
<b>(16.a.ii) Tariff in urban areas</b>	Re. 1.00 per metered call
<b>(16.b) Tariff for local call from PCOs/VPTs (other than from STD/ISD PCOs/VPTs)</b>	
<b>(16.b.i) in rural areas</b>	Ceiling of Rs. 1.00 per metered call
<b>(16.b.ii) in urban areas</b>	Ceiling of Rs.1.20 per metered call
<b>(16.c) Tariff for local and STD/ISD calls from STD/ISD PCOs/VPTs</b>	
<b>(16.c.i) in rural areas</b>	Ceiling of Rs. 1.20 per metered call <u>plus</u> Ceiling of Rs. 2 for each STD/ISD call (in addition to applicable Long Distance tariff)
<b>(16.c.ii) in urban areas</b>	Ceiling of Rs. 1.20 per metered call <u>plus</u> Ceiling of Rs. 2 for each STD/ISD call (in addition to applicable Long Distance tariff)

<p><b><u>(17) Dial-up Access charges for Internet during off-peak hours</u></b></p> <p><b><u>(18) All Other Matters Relevant to Tariffs, including billing cycle, and special and supplementary services not elsewhere specified</u></b></p>	<p>Reduced Dial-up charges for off-peak hours to be provided to ISPs using both access codes 172 XXX through E1/R2 lines and ISDN PRI Access code</p> <p>Forbearance</p>
<p><b><u>EXPLANATORY NOTES:</u></b></p> <p><b><u>(a) Rural subscribers</u></b></p>	<p>Subscribers residing in SDCAs specified as Rural in the new Basic Service License.</p>
<p><b><u>(b) Urban subscribers</u></b></p>	<p>Subscribers residing in SDCAs specified as Semi-Urban and Urban in the new Basic Service License.</p>
<p><b><u>(c) Standard tariff package(s)</u></b></p>	<p>A standard tariff package provides basic services at the tariffs specified in the schedule, and includes the specified number of free calls. Different rentals prescribed for the three categories of subscribers in (a) to (c) above imply that three different standard tariff packages are specified in this schedule.</p>
<p><b><u>(d) Alternative tariff packages</u></b></p>	<p>Alternative tariff and free call allowance could be offered to subscribers by service providers, in addition to those offered in the standard tariff packages. In the "alternative tariff packages", items for which tariffs are specified in terms of a ceiling will continue to be subject to the specified ceiling. Items for which a specific amount of tariff is shown in this schedule (e.g. rentals and call charges) may have any alternative tariff in the "alternative tariff package". Similarly, an alternative free call allowance could be provided in an "alternative tariff package" subject to a ceiling of 25 on total number of alternative tariff plans on offer.</p>

<b><u>(e) Mandatory provision of standard packages</u></b>	Subscribers must have the option of getting basic services (other than ISDN) at tariffs and free call allowance specified in this schedule. In addition, the service provider may offer alternative tariff packages to the subscribers. The subscriber shall be free to choose among various tariff and free call offers available
<b><u>(f) Capacity of Local Exchange system (SDCA)</u></b>	The sum of the capacities of all exchanges in a local area. Any augmentation of the exchange capacity after the date of implementation of this Order shall automatically be taken into account for re-classification for the purposes of tariffs.
<b><u>(g) Short Distance Charging Area (SDCA)</u></b>	Short Distance Charging Area (SDCA) is one of the 2647 Local Areas whose details are provided in the Basic Service Licenses and also in the Numbering Plan wherein for each SDCA, a unique STD code is provided. Local call charges are applicable on Intra-SDCA traffic and for calls within the distance category "0 to 50 kms".
<b><u>(h) Charging Centres</u></b>	Charging centres are classified as "Long Distance Charging Centre" (LDCC) and "Short Distance Charging Centre" (SDCC). For adjacent SDCAs, SDCC is the reference Charging Centre. For non-adjacent SDCAs, LDCC is the reference Charging Centre.
<b><u>(i) Long Distance Charging Centre (LDCC)</u></b>	Long Distance Charging Centre is a particular Trunk Exchange in a long distance charging area as presently defined for the purpose of charging for trunk calls. Headquarters of a Secondary Switching Area are generally LDCCs.
<b><u>(j) Short Distance Charging Centre (SDCC)</u></b>	Short Distance Charging Centre is a particular exchange in short distance charging area as presently defined for the purpose of charging trunk calls. Headquarters of Short Distance Charging Areas are generally SDCCs.
<b><u>(k) Secondary Switching Area (SSA)</u></b>	Secondary Switching Area (SSA) is a territory, whose boundaries, generally but not necessarily, are co-terminus with those of a revenue District and in which normally one Trunk Automatic Exchange is located.

**Schedule II**  
**Cellular Mobile Telecom Service (CMTS)**

ITEM	TARIFF
<b>(1) Date of Implementation</b>	1 April, 2003
<b>(2) Rental and airtime charge</b>	<p>Forbearance provided that:</p> <p>Every service provider shall specify a monthly rental and airtime charge per minute with a pulse duration of 30 seconds, as a “Reference Tariff Package of the Service Provider”.</p> <p>No airtime charge for incoming calls in any of the tariff package i.e. Reference/Alternative.</p>
<b>(3) Refund of deposits.</b>	All deposits (including, inter-alia, STD/ ISD deposits) must be refunded in full to the subscriber at the time of disconnection subject to the condition that outstanding subscriber bills, if any, may be adjusted in the final transaction.
<b>(4) Installation charge</b>	One time installation charge may be levied by a service provider only when a customer initially gets connected to the network of the service provider. No installation charge shall be levied when a subscriber moves from one package to another offered by a service provider.
<b>(5) Roaming</b>  <b>5.a) Regional &amp; National roaming.</b>  <b>5.a.i) Refundable Security deposit</b>  <b>5.a.ii) Entry Fee (one time charge)</b>  <b>5.a.iii) Monthly Access Charge for Regional and/or National Roaming.</b>  <b>5.a.iv) Airtime charge</b>	   Forbearance   Nil   Rs.100.00 as ceiling.   Rs.3.00 per minute as ceiling.

<b>5.a.v) PSTN charge</b>	As applicable from time to time to the fixed network.
<b>5.a.vi) Surcharge</b>	15% as ceiling on airtime component only
<b>5.b) International Roaming.</b>	Forbearance.
<b>5.c) Other matters related to roaming.</b>	Forbearance.
<b>(6) Tariff for prepaid service</b>	Forbearance;  Provided that –  a) At least one denomination of pre-paid cards offered by every Service Provider must be for an amount of Rs.300.00 or less with a corresponding validity period of at least one month.  b) The charges for replacement of lost/damaged SIM card shall be based on cost with a reasonable mark-up.  c) If there is any amount that is unused at the end of the validity period, this amount should be carried over to the renewed card, if such renewal is done within a reasonable, specified period.  d) In the case of each pre-paid card package, the customer should be prominently and clearly informed of the total amount that is available in the pre-paid card package for making calls, i.e. to pay towards usage.
<b>(7) Other matters relevant to tariff including billing cycle.</b>	Forbearance.

Notes:

- 1) The Reference Tariff Package shall always be available to the customer together with any other tariff offers.
- 2) The Service Provider shall give wide publicity to its Reference Tariff Package.

- 3) The Authority shall continue to monitor the tariffs in the market, and if required, shall reintroduce standard tariff package(s) for one or more licensed service areas as may be deemed necessary.
  
- 4) From time to time the TRAI will make public a comprehensive list of the Reference Tariff Packages of all CMSOs in the country through its web site and through consumer organisations registered with it to keep the public informed of all Reference Tariff Packages on offer.

**EXPLANATORY MEMORANDUM**

1. The Twenty Fourth Amendment to the Telecommunication Tariff Order (“TTO”), 1999, the first Tariff Order during 2003, is an outcome of the deliberations carried out by the Authority through its Consultation Papers and its Open House Discussions on Tariffs for Basic Services, Tariff for Cellular Mobile Services, Issues relating to Interconnection between Access Providers and National Long Distance Operators and the Reference Interconnect Offer (RIO). It also synthesizes the various responses and inputs received through the Consultation Papers and suggestions from various quarters.
  
2. The objective of this Explanatory Memorandum is to provide a clear and transparent exposition of the Order (“TTO 2003”) which provides retail tariffs for basic and cellular mobile services. The TTO 2003 builds upon the tariff regime that was earlier put in place through the TTO of 1999. TTO 1999 implemented a phased tariff re-balancing to prepare the market situation for the ensuing competition, so that the adjustment required by the incumbent to the sharp price decline due to competition would be mitigated when such a decrease takes place. The competition in the market, with the entry of additional service providers in both the national long distance and the international long distance segments, has led to a further, large decrease in the prices for these services. While this has led to a drop in the above cost tariffs, the below cost or near cost tariffs could not increase because they were specified at particular levels to take account of the social objectives.
  
3. The drastic reduction in long distance call charges implies that the source of cross-subsidy that was earlier available to cover the below cost tariffs, has been reduced to a major extent. This implies a need for two types of policy changes. One, to increase the below cost prices so that these cover at least some part of the uncovered costs, and the second that to the extent that costs of access are not covered by the tariffs, an access deficit charge (“ADC”) should be given to the access provider who incurs access deficit. In this regard, it is worth noting that the fixed service provider incurs



an access deficit due to the rental being below cost, the provision of free calls, and call charge for certain calls being below cost. On the other hand the cellular mobile and Wireless in Local Loop with limited mobility (WLL-M) services are able to recover all their costs.

4. The Authority has taken account of these factors and has determined an interconnection usage charge (IUC) regime for basic and cellular mobile services service, which is given in a Regulation notified separately. That Regulation also addresses the amount of access charge payment to be made to basic service provider by cellular mobile for its calls within a License area (intra-Metro or intra-Circle), and vice versa.
5. The IUC regime is not independent of tariffs, because the amount of ADC to be covered from various calls depends inter alia on tariffs. Thus, in determining tariffs, the Authority had to consider the objective of affordability as well as not fixing too high an ADC which would become a handicap for the fixed line segment of the market in competing with cellular mobile and WLL-M.
6. Therefore, the tariffs have been determined in such a manner that the objective of NTP 1999 can be achieved while maintaining the sustainability of the fixed line segment of the market, which is and shall continue to be the dominant portion of the market for some time to come. If the ADC is not recovered, the sustainability of the fixed line service will become increasingly difficult.
7. At the same time, if the prices of local call and shorter distance calls are kept at (or close to) the prevailing levels, the shortfall to be covered through ADC will be more and will have to be recovered either through increasing monthly rental or by increasing the call charge for long distance calls. An increase in monthly rentals would have a relatively low impact on reducing the ADC (an average increase in monthly rental of Rs. 4.50 for all subscribers is equivalent to a general increase in call charge of 1 paise per minute), and in addition a large increase in monthly rentals would adversely affect the demand for phone connections. This would lead to inability in achieving the teledensity targets for our country. On the other hand, if rental is not increased at all,

the call charges for long distance calls would have to be increased to a larger extent by the fixed network, making it un-competitive with WLL-M and cellular mobile.

8. Thus, it is necessary to increase local and short distance call charges even as it is ensured that such increases are the very minimum and the recovery of the balance ADC takes place as far as possible from the long distance call charges in a sustainable manner.
9. To the extent that the Authority provides ADC to the service provider, the requirement for USO will be minimized. The USO will, however, still be required because while the ADC will cover the costs for SDCAs with average costs, there will be SDCAs with higher costs whose costs will individually not be covered by the ADC payments. It is nonetheless expected that with an increased size of the network, the overall cost and the USO requirements will fall over time.

#### **Tariffs For Basic Service**

10. The analysis of the tariffs for basic service notified in Schedule I takes account of the recent developments in the License regime and the competition that has manifested itself in the market for basic service (including WLL-M), national and international long distance services, and the cellular mobile service. These developments need to be combined with several other concerns, including for example:
  - the NTP 1999 objective of affordability and an increase in teledensity;
  - the extent of competition in the three segments of the telecom market namely access provision, DLD and ILD;
  - whether to continue with the existing tariff framework of tariff regulation through standard tariff package (STP) and alternate tariff package (ATP); and
  - concerns regarding level playing field among various services.
11. Today, there is a stronger conflict between balancing the social and the commercial objectives of the basic service providers, than was the case at the time of the Telecommunication Tariff Order (TTO) 1999. In order to gain a better perspective on

the issue of affordability, the Authority made detailed studies and commissioned the National Council of Applied Economic Research (NCAER) to carry out studies and submit a report on this issue. Two reports titled 'Telephone Study, 2002' and 'Affordability of Telecommunication Services, 2002' were received from them.

12. The first was a survey of the consumers covered in the overall expenditure survey made by NCAER to determine the levels of monthly rental and call charge that were considered as affordable by the existing as well as the potential subscribers of basic services. The second study carried out an analysis of the data on affordability and income levels of various subscribers, and identified the willingness of various subscribers in diverse urban and rural areas in various States and the metropolitan cities. The results of the study indicated that the monthly rentals and call charges should remain low, with minimal changes being made to the tariff regime, in particular for the rural subscribers.

### **Monthly rentals**

13. TRAI's examination of the issue of affordability suggests that it continues to be critical and the rentals as well as the call charges will need to be regulated to make these affordable to customers at different levels. The Authority has therefore decided that the monthly rentals for exchange capacity of upto 29,999 lines should not increase and even in the higher capacity exchanges increase should be minimal. Most of the rural subscribers are in the categories for which rental has not been increased. In this regard, the Authority has also taken into account the fact that the growth rate for subscribers in these rural areas is low, and an increase in monthly rentals could affect it adversely.
14. The Authority also considered the submissions from various stakeholders on the determination of monthly rentals. As in the case of the previous consultations on basic service tariffs, the views cover an entire spectrum of opinions, ranging from decrease in monthly rental together with an increase in free calls, to an increase in monthly rental and doing away with free calls. The Authority therefore has decided to increase the monthly rentals only in the two largest categories for the purpose of rentals.

15. The Authority had received various submissions from Senior Citizens forum as well as individuals on keeping the rentals lower for Senior Citizens. The Authority therefore has decided to keep the monthly rentals unchanged for Senior Citizens.
16. The Authority then considered whether it should provide separate and higher monthly rentals for commercial subscribers. It took account of the recent experience in the market where the possibility of charging higher rentals from commercial subscribers and of providing lower free calls was not exercised by any of the service providers. The Authority however was of the considered opinion that higher rental for commercial subscribers is eminently justified as they must pay tariffs which are as close to the cost of the service as possible. It has, therefore, decided that commercial rentals would be valid for urban areas as per the levels specified in TTO 1999, for the two highest monthly rental categories. These higher levels have yet not been given effect by the operators.
17. This Order re-iterates for WLL-M, the cost-based monthly rental that has been specified by the Authority after its first review of these rentals, i.e. Rs. 200 per month.
18. In view of the objective of keeping monthly rentals low, there is a need to specify a standard tariff package. The Authority is therefore continuing with such a package as a regulatory mechanism for ensuring a minimum tariff combination being available to the customers.

#### Local Call Charge

19. The Authority received feedback from various stake holders with respect to their suggestions on local call charges. While some of the suggestions related to reducing the existing duration of local calls from 3 minutes, a few others mentioned that number of pulses at the beginning of calls should be higher and at a later stage should be lower. Yet another genre of suggestions was that the tariff for a local call should be in two steps, viz for call set up and for the duration. This however was not considered by the Authority as the feedback was that it could be difficult to implement in the billing systems employed by different operators.

20. In a large number of cases, the view was that there was a need to bring about cost orientation in local call charges and that the unit of timing should be suitably recalibrated for this purpose.
21. As shown in the Authority's analysis of the IUC, if all of the ADC is to be equally distributed on all the minutes of use, then the local call charge should be Re. 1.00 per minute to cover costs. This charge, however, would be too burdensome on the consumer and would not encourage the usage of telephones. A large portion of the total subscriber base today uses the telephone mainly for local calls, and increasing the local call charge to cover costs would adversely affect affordability for these subscribers. At the same time, with the long distance call charges falling precipitously, the source of cross subsidy to bear the ADC has now gone virtually dry. Thus, some increase in the local call charge is inescapable if the fixed line service has to be made sustainable.
22. The Authority has given considerable thought to the conflicting concerns mentioned above, and has reached the conclusion that it will not alter the existing call charges, but the change in call charge will be brought about by altering the pulse duration, free call limit, and the threshold level above which the call charge of Rs. 1.20 applies.
- The call charge for initial calls will remain the same in both the rural as well as in urban area, respectively at Rs 0.80 and Re. 1.00 for the first 300 pulses, and will be 1.20 thereafter.
  - The pulse duration for local calls will be 120 seconds, as a predominant portion of the calls are of a duration less than two minutes.
  - The Authority has provided IUC for calls to and from WLL(M) also. Taking account of the competition in the WLL(M) segment, the Authority has forborne with respect to calls from WLL(M). Incoming calls would remain free.

#### Long Distance Call Charge

23. As mentioned above, competition in the long distance market has led to a sharp fall in prices. This provides a basis for considering forbearance for these tariffs. However,

there are two important issues to consider in this regard. One pertains to the tariffs of STD calls for short distances, and another relates to the sustainability of fixed line service if the long distance tariffs continue to fall. As shown below, the Authority has decided in favour of a partial forbearance for long distance tariffs, namely that the tariffs for certain shorter distance calls have been specified but the tariffs for longer distance calls have not been specified.

24. For long distance call charge, a strong view was presented in favour of tariff forbearance, while there was also a proposal that these tariffs should have a floor and a ceiling.

(a) Distance categories of “0 to 50 kms” Intra-License area and Inter-License area calls

25. At present, the tariffs for “0 to 50 kms.” STD calls (both intra- and inter-circle) are the same as that for local calls. These calls therefore are seen by the consumers as if they were local calls, and the consumer reaction to tariffs for such calls would be similar to a change in the local call charge. Moreover, in rural areas, such tariffs have provided a basis for enhanced usage of such calls. It has also led to a greater community of interest being established over these distances. The Authority has, therefore, decided that for these distance categories, i.e. for “0 to 50 kms” Intra-License area and Inter-License area calls, the call charge should be the same as for local calls. This will maintain the ease of calling over relatively shorter distances provided in the present tariff regime, and will be beneficial in particular for the rural subscribers.

26. It should be noted that the Authority is not in favour of the application of local call tariffs for neighbouring SDCAs. Because of compelling economic reasons all such calls are to be clearly categorized and treated as either local calls or long distance calls going by their distance and charged accordingly. Some of these calls involve carriage over long distances, even hundreds of kilometers.

(b) Other Distance categories

27. In recent months, the TRAI has analyzed the costs of providing long distance calls in the context of its IUC exercise. Judging from these results, it is possible that competition in the long distance market may lead to even lower prices for these calls.

While this would in general be good for the consumer in the short run, such a price development would make it more difficult to recover the ADC from long distance tariffs for the fixed line phones. With the imposed below cost tariffs (i.e. prices that do not cover average ADC) for monthly rental and local calls the fixed line service will be unable to recover the ADC from the long distance tariffs. This would make the sustenance of this service even more difficult. In this background the incumbent operator has suggested that TRAI should fix a floor to the long distance tariffs to help the viability of the fixed line service. This suggestion is also to address the possibility of below cost pricing by any long distance service provider.

28. The Authority considers it undesirable to fix a floor on a price in a competitive market, because this prevents the benefits of competition to be passed on to the customer. The IUC charges will implicitly function as a floor to the tariffs. Further, in addition to specifying the tariffs for distance categories “0 to 50 kms.” for intra-circle calls and inter-circle calls, the Authority has decided to offer forbearance for long distance calls, subject to a ceiling of Rs. 8.40 per minute.
29. Schedule I addresses intra-circle and inter-circle long distance calls separately. This makes it possible to ascertain the applicable tariffs for the national long distance calls (i.e. those that can be carried only by an NLDO) and other long distance calls which are intra-circle calls.

Inter-network calls made within the License area

30. These are calls made within a metro or within a circle from basic service to cellular mobile.
31. For calls within a circle from fixed line to cellular mobile, the Authority has fixed a charge of Rs. 1.20 per minute. These calls enable the subscriber to access the cellular mobile subscriber over a large area, and they normally involve carriage from the basic service subscriber beyond the SDCA. The cost of carriage therefore has also to be obtained from such a call charge, and Rs. 1.20 per minute has been fixed taking these factors into account. Details on IUC for the various calls are in the Regulation on IUC.

32. For calls from basic service to cellular mobile in metros that are classified as separate License areas for cellular mobile, i.e. Chennai, Delhi, Kolkata and Mumbai, the calls charge will be Rs. 1.20 per 90 seconds. Details on IUC for the various calls are in the Regulation on IUC.

### **International Calls**

33. The tariffs for international calls have also decreased sharply, and are likely to decrease further. The Authority has decided to forbear with respect to the tariffs for these calls.

### **Free Calls**

34. During its consultations, the service providers suggested that free calls should be given up or drastically curtailed, and the consumers were of the view that these calls should be increased. The Authority is of the opinion that similar to the policy of intervention in the case of local call charge, an allowance of free calls should also be maintained, but the extent of the free calls may be recalibrated.

35. The free call allowance is as follows:
- Rural subscriber: 50 metered call units per month of the billing cycle
  - Urban subscriber: 30 metered call units per month of the billing cycle

36. For WLL-M, there are no free calls in the standard tariff package.

### **Peak/Offpeak hours**

37. With the drastic fall in long distance tariffs, the difference between peak and off-peak call charge may not remain substantial. In view of the dramatic price developments in the market and the fact that the ADC requires tariffs in line with those prevailing in the market, the Authority has decided to forbear with respect to peak/off-hours and left the decision on this matter to the service provider.



### **Other issues**

38. The Authority have received representations from some ISPs regarding extending the same facility for ISPs using ISDN PRI Access code for dialup access for Internet Service, e.g. 373XXXX. The Authority is of the opinion that the facility of reduced dialup charges for Internet access during off peak period should be available to all the users of Internet services irrespective of the nature of junction lines i.e. E1/R2 or ISDN PRI utilized by ISPs.

### **Tariffs For Cellular Mobile Service**

39. The tariff for cellular mobile are provided in Schedule II. In the case of tariffs for cellular mobile service, the Authority has been guided by the fact that the cellular sector has witnessed substantial growth and tariffs in the cellular sector have also been subject to declining trends due to the competition prevalent in the market.
40. The key consideration in outlining the policy regime for the cellular services was to see the continuance of the market mechanism playing its role in conformity with the dictates of competition. To this end , it was felt that apart from roaming which would still continue to be regulated, as per the provisions of the 23<sup>rd</sup> amendment to the TTO 1999, the Authority would reiterate continued forbearance for outgoing calls in the sector.
41. To this extent, it was felt that as cellular tariffs, i.e. rental and originating airtime are market driven, there is only the need to fix the mobile termination charge (MTC) on the basis of the costs involved in termination.
42. The Authority has decided that with the payment of MTC, the receiving party shall not pay for any incoming airtime for cellular mobile.

## **ANEXO 4**

Telecommunications Interconnection Usage Charges (IUC) Regulation, 2003 dated January 24, 2003 (the “IUC Order”).

<http://www.trai.gov.in/Notificationfy.htm>

**Telecom Regulatory Authority of India**  
**Notification**  
**New Delhi, the 16th June, 2003**

No.311-1/2003-Econ

In exercise of the powers conferred upon it under section 36 read with clauses (ii), (iii) and (iv) of sub section (b) of Section 11(1) of the Telecom Regulatory Authority of India Act, 1997 as amended by TRAI (Amendment) Act, 2000, to fix the terms and conditions of interconnectivity between Service Providers, to ensure effective interconnection between different service providers and to regulate arrangements amongst service providers of sharing their revenue derived from providing telecommunication services, the Telecom Regulatory Authority of India hereby makes the following Regulation.

**THE TELECOMMUNICATION INTERCONNECTION USAGE CHARGES  
(IUC) (SECOND AMENDMENT)) REGULATION,2003 (3 of 2003)**

**Section I**

**Title, Extent and Commencement**

1.Short title, extent and commencement:

(i) This Regulation shall be called "The Telecommunication Interconnection Usage Charges (IUC) (Second Amendment) Regulation 2003". (IUC Regulation).

(ii) This Regulation shall be deemed to have come into force from the date of notification in the official Gazette.

**Section II**

2.1 Clause 2.3 under Section II of The Telecommunication Interconnection Usage Charges (IUC) (First Amendment) Regulation, 2003 (2 of 2003) dated 27.03.2003 shall be deleted and substituted by the following:

(vi) All existing interconnect agreements/arrangements as on date shall stand amended on 1st May, 2003 so as to conform to the notified framework of the IUC regime and these shall be submitted to TRAI for registration by 30th June, 2003, and for subsequent changes as per reporting requirement.

**Section III**

3. Explanatory Memorandum This Regulation contains at Annex A, an explanatory memorandum to provide clarity and transparency to matters covered under this Regulation.

**By Order**

**(DR. ROOPA R. JOSHI)**  
**ADVISOR (ECONOMIC)**

**EXPLANATORY MEMORANDUM**

1. Consequent upon the Telecommunication Interconnection Usage Charges( IUC) (First Amendment) Regulation, 2003 (2 of 2003) dated 27.03.2003, all service providers were required to file all revenue sharing agreements with the Authority latest by 16th May, 2003.
2. The Authority is in receipt of various representations from various service providers expressing their inability to file the revenue sharing agreements by the above-stipulated date and sought an extension of the same.
3. The Authority considered the representations of the service providers and decided that all revenue sharing agreements which have to conform to the IUC Regulation will now need to be filed with the Authority latest by 30th June, 2003 without any delay.

## **ANEXO 5**

Consultation Paper on the Implementation of the IUC Regulation dated May 15, 2003  
(the "IUC Consultation Paper").

<http://www.trai.gov.in/consultation.htm>

# **Telecom Regulatory Authority of India**

## **Consultation Paper on IUC issues**

**Consultation Paper No. 2003/1 dated 15<sup>th</sup> May 2003**

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## **PREFACE**

1. On 24<sup>th</sup> January 2003, the Authority notified a new Telecom Tariff Order (TTO) and an Interconnect Usage Charge (IUC) Regulation. The IUC Regulation encompasses also a regime to address the Access Deficit Charge (ADC) that would compensate for the access deficit that arises for the basic services since the monthly rental and local call charges do not fully cover the relevant costs.

2. The new tariff and IUC regime have been implemented from 1<sup>st</sup> May, 2003. The Authority has provided greater flexibility with respect to the tariff regime, in the form of alternative tariff packages. This has made possible the price changes being witnessed through the ongoing competition in the market which have increased the options available and the reduction in several tariffs. The ADC regime does not envisage alternative means of addressing the issue other than providing alternatives of Uniform and Non-Uniform ADC regimes, and any points raised with respect to this regime have to be seen in that context.

3. The Authority has received several communications with respect to both the tariff regime and the IUC regime. The various concerns, especially with respect to the IUC regime, have also been emphasized to the Authority in its discussions with several stakeholders. These pertain to aspects such as sustainability of the IUC regime over time, consistency among the different Schedules of the IUC Regulation specifying the regime, and the possibility of considering improvements that would encourage a competitive market and discourage growth of grey area traffic.



4. This consultation paper has brought out for public consultation a number of issues based on inputs received from various stakeholders.

These issues have been grouped in four main categories i.e.

- (i) Interconnect Usage Charges (IUC)
- (ii) The Access Deficit Charges (ADC)
- (iii) Tariffs
- (iv) Calling Party Pay (CPP)

5. The Authority invites written responses from all stakeholders latest by closing hours of 06/06/2003. It would be appreciated if the response is accompanied with an electronic version of the text through Email.

6. For further clarifications please contact, Shri R. K. Bhatnagar, Advisor (FN) - Tel. No. 26166930, Email address [traio6@bol.net.in](mailto:traio6@bol.net.in) or Dr. (Mrs.) Roopa R. Joshi, Advisor (Economics) - Tel. No. 26160752, Email address: [traio1@bol.net.in](mailto:traio1@bol.net.in). The Fax No. of TRAI is 26103294.

## **1. INTRODUCTION**

1. The objective of this Consultation Paper is to put in place a framework for discussion to consider suggestions for improving and streamlining the interconnection regime. Section 2 of this paper provides a brief background to the Authority's IUC Regulation dated 24.1.2003, Telecommunication Tariff Order dated 24<sup>th</sup> January 2003, and the 'Calling Party Pays' regime for cellular mobile introduced through a consultation process that began with the TRAI's Consultation Paper on the subject, dated 23<sup>rd</sup> May, 2001 (Consultation Paper No. 2001/1).

2. Section 3 provides a summary of various issues and comments that were highlighted through the feedback received by the Authority from various stakeholders through written communications, representations and other inputs received during the presentations made to the Authority. These points are issues submitted to the Authority for consideration and should not be seen as representing the view point of the Authority. Section 4 raises certain questions that cover the various issues on Interconnection Charge Regime, related Tariff and CPP issues for discussions/ consultation.

## **Section 2**

### **Background to the IUC Regulation**

1. In a Multi-Operator environment, it is important to specify an IUC regime which gives greater certainty to the Inter-operator settlements and facilitates interconnection agreements. Thus, there was a need for specifying cost based Interconnection Usage Charges (IUC) for origination, transit and termination in a Multi-Operator environment. Origination and Termination usage charges include Access Deficit Charge (ADC) payable to the Basic Service Operators which they must get in order to keep the rental as well as local calls affordable.
2. National and International Long Distance markets were opened up for competition and these policy measures resulted in a significant reduction in National and International long distance tariffs due to competitive pressures. Table 1 shows the comparison of STD charges at the end of tariff rebalancing period as per TTO'99 and prevailing market rates. This shows that there has been a drastic reduction in the margin available from long distance calls to fund the Access Deficit incurred by the Basic Service Operators due to rentals being significantly lower than actual costs.

### **Interconnection Usage Charges, ADC and related Tariffs**

3. The exercise to determine IUCs involved an assessment of the various cost items attributable to the different network elements used in setting up of a call in a Multi-Operator environment. Every effort was made to

accurately assess the network element costs based on the inputs provided by various operators including the incumbent.

4. The IUC determination exercise started with detailed discussions with various stakeholders based on TRAI consultation paper 2001/5 dated 14<sup>th</sup> December 2001. The paper had proposed a number of methodologies for calculating Origination, Transit and Termination charges in a Multi-Operator environment based on International best practices. The paper had also identified the Network elements involved in the carriage of a long distance call from its origin to destination in a Multi-Operator environment.
5. The Interconnection Usage Charges for Origination, Transit and Termination are also the underlying costs of carrying a call from the calling to the called party and are thus closely linked with determination of retail tariffs. The tariff re-balancing effected under the Telecommunication Tariff Order (TTO) 1999 by the Authority was followed by intense competitive price declines in the long distance sector, which brought down the prices substantially. With the initiation of the IUC exercise, the Authority was also in a position to carry out its tariff review which has become essential in the new Multi-Operator Multi-Service telecom scenario which has emerged after opening up of all the segments of telecom service market such as Cellular, Basic and Long Distance. To discuss both Basic Service tariff and IUC, which are closely linked, the Authority released its Consultation Paper No. 2002/3 dated 23<sup>rd</sup> September 2002. This paper dealt with tariffs for Basic Services as well as the IUC regime including Access Deficit Charge.
6. Framework of the IUC regime was already established by TRAI through its Regulation on Reference Interconnect Offer (RIO). As detailed therein,

IUC has to be determined based on minutes of usage for various Unbundled Network Elements and the cost of these elements. As brought out in the Reference Interconnect Offer (RIO), the IUC for Origination, Transit and Termination are based on the principles of element based charging i.e. one operator charging the other for the resources consumed for carriage of its calls in terms of minutes of use (MOU).

7. The Access Deficit Charge (ADC) as notified by TRAI on 24<sup>th</sup> January 2003, was derived by comparing the cost based rental and local call charge with an affordable level for rental/ local call charges, special concessionary local call charges in the rural areas, provision of free calls, and any other below cost tariffs to make the Basic telecom services affordable to the common man to promote both Universal Service and Universal access as per NTP'99. These tariffs were specified in the Authority's Tariff Order dated 24<sup>th</sup> January 2003. In order to reach the final estimates of IUC, the IUC Regulation had taken into account the requirements of Access Deficit Charge arising out of the Tariff Order. The distribution of ADC on different tariffs streams, was notified by the Authority in its IUC Regulation dated 24.1.2003
8. The ADC compensates for the below cost rentals and the free calls provided for Basic Service such as POTS. For other services such as Cellular Mobile and Wireless in Local Loop with limited mobility (WLL-M), the Access Deficit Charge was not applicable as the rentals and call charges in these segments cover costs as these tariffs have been left to market forces and have not been kept below cost by regulation.
9. The feedback from most operators at that stage had indicated that IUC rates should be prescribed and should be based on element based

methods while providing for its linkage with long distance tariff. It was also suggested that the regulatory obstacles to interconnection both in terms of the rationalization of its levels and technical dimensions needed to be seen in respect to the competitive conditions/ bottleneck facilities that exist in the sector.

10. Based on BSNL data and various inputs received from stakeholders, the Authority specified its IUC regulation with various schedules specifying origination, carriage and termination for intra circle and inter circle as well as inter network calls to be implemented by operators w.e.f. 1.4.2003. Service providers were to file IUC compliant tariff plans to the Authority in advance. However, given the late receipt of such plans and the fact that the plans required to be widely publicized and the issues related to settlement of inter operator interconnect charging was also to be resolved, the Authority deferred the date of implementation to 1.5.2003. These issues were settled with the concurrence of the operators through a number of meetings amongst the operators and also their meetings with the Authority and IUC regime has been implemented from 1.5.2003.
  
11. The total amount of ADC is a large amount, which can be seen from Table 2 which provides an illustrative estimate of the annual Access Deficit based on a subscriber base of 4 Crores Fixed Lines. The large ADC, combined with the fact that call charges for local calls and the relatively short distance calls have to be kept reasonable low for affordability purposes, implies a substantial per minute ADC for different types of calls. Table 3 shows the ADC component, which has been loaded on various type of Inter-Network Calls based on differential (non-uniform) ADC. Table 4 provides the ADC values for the International Long distance service segment. IUC Charges with Uniform and non-uniform ADC Inter-Circle

and Intra-Circle for various types of calls are given in Tables 5 and 6 respectively.

### **Calling Party Pays (CPP) for cellular mobile**

12. Worldwide, the cellular mobile tariff regime in various countries can be divided into the following three categories.

- i) Countries having CPP regime right from the launch of Cellular Mobile Services e.g. all European countries.
- ii) Countries, which migrated from Mobile Party Pays (MPP) to Calling Party Paging (CPP) e.g. a number of Latin American countries.
- iii) Countries, which are continuing in Mobile Party Pays (MPP) regime e.g. USA, China, Singapore, and Hong Kong.

13. Over time, several countries have adopted CPP in place of a Mobile Party Pays (MPP) regime. Some studies have shown that the CPP regimes are likely to increase the growth of cellular mobile services and hence of the telecom sector itself.

14. The TRAI began its Consultation process on CPP with a Consultation Paper in 2001, and discussed the matter with various stakeholders and experts in the area. With the introduction of the IUC regime for various access services, TRAI was of the opinion that it should also introduce the CPP regime for cellular mobile, both for consistency of the regime as a whole as well as the likely contribution that such a change would make to the growth of the telecom sector.

### **Section 3**

#### **Issues raised in the feedback received by the Authority on the IUC Regime**

1. The Authority has received a number of written communications from service providers and others on the subject of IUC charges. The Authority also initiated a process of discussions with all the Service Providers to obtain their inputs covering key important issues. During the presentations, a number of references and suggestions related to the Interconnection Usage Charge regime were made. Annex 1 gives the details of these representations.
2. The various issues, viewpoints, comments received have been summarized in this Section. The Authority feels that the issues raised should go through the consultation process.
3. The issues, viewpoints and comments come mainly under four categories. These are :
  - Interconnection Usage Charges
  - Access Deficit Charges
  - Tariffs
  - Calling Party Pay Regime

#### **Section A: Interconnection Usage Charges: Clarifications, Anomalies, and Suggestions**

4. Interconnection usage charge are specified as payment for the work done for origination, carriage or termination of a call. In this section, we address the



anomalies or concerns pointed out with respect to the interconnection usage charges :

(a) Greater clarity should be provided in the Schedules of the IUC Regulation, especially the linkages and consistency between the different Schedules and the applicable IUC charges for all kinds of calls. Also, the termination charge for long distance calls from cellular mobile/WLL(M) to Fixed Line should not be less than the termination charge for calls within a local area.

(b). The IUC Regulation specifies identical interconnection charges at both originating and terminating ends of the networks. It has not taken into account the extra costs that are incurred on account of higher Operational Expense (Selling, acquisition, billing and bad debts) at the originating end.

(c) The IUC for termination should be made identical for all Intra-SDCA handovers (e.g. 25 Paisa per minute). This will facilitate easier implementation of the regime. Another suggestion was to have IUC charges of 30 (or 40) Paisa per minute for Metro (or Circle) cellular mobile/WLL (M) networks should be made uniform at say 30 Paisa for Metro as well as Circle Networks. Moreover, the higher termination charges for WLL (M) at 50 Paisa per minute for Inter-Circle calls should also be kept at the above uniform amount.

(d) The IUC regime should take account of the possibility of far-end handover by the fixed line operator to cellular mobile, and provide for relevant IUC in such cases.

(e) The IUC Regulation gives the charges for direct connectivity between Access Providers and between them and NLDOs/ ILDOs. Direct connectivity, if one of the party demands it, needs to be made mandatory through regulations.

Moreover, the IUC regime should specify charges for transit in Intra-SDCA network for overflow and techno-economic reasons. Further, IUC should also be specified for other services, such as SMS.

(f) Carriage Charges of Rs. 0.20 to Rs. 1.10 per minute for Long Distance Traffic are on the lower side and would not cover the costs of a stand-alone or new entrant NLDO, in view of the lower traffic that would be available to such operators.

(g) No termination charges should be provided for intra-circle calls to Cellular Networks. These amounts could be compensated through higher termination charges for Inter-Circle traffic.

### **Section B : Access Deficit Charges:**

#### **Sustainability, Level Playing Field, Alternative Options**

5. Several concerns have been raised with respect to the access deficit charge (ADC), which has been specified only for calls involving fixed lines. Thus, the loading of ADC is such that it makes it possible for services other than fixed line to give relatively lower tariffs. These and the other issues raised in this context are summarized below :

(a) The Authority has provided two alternatives for ADC, namely Uniform and Non-Uniform ADC regime. With the choice for ADC (uniform/ differential) being given to individual operators, there will be a chaotic situation when multiple operators in circles start adopting different practice.

(b) The ADC regime should ensure that there is no by-pass of traffic through arbitrage and abnormal routes i.e. at the cost of licensed service providers.

(c) Since the ADC is loaded only on calls involving fixed lines, the tariffs for calls from/to cellular mobile and WLL (M) would be cheaper, with this advantage being most strongly available to calls from cellular mobile to cellular mobile. Further, cellular mobile Service Providers would be able to avoid long distance carriage charge for intra-circle cell to cell calls because they would not need to give the carriage charge which has been received for Intra-Circle calls from fixed line. In the case of calls from fixed line, these carriage charges range from Rs. 0.20 to Rs. 1.10 per minute. Amendments to the ADC regime should be considered to address these situations.

(d) The estimated amount of ADC is large, as shown by Table 2, and if all of it has to be recovered from long distance minutes involving fixed line, then the ADC per minute will become large since the number of such minutes available are likely to be a small share of the total minutes used. Moreover, the ability of cellular mobile and WLL (M) service providers to charge lower tariffs for long distance will imply a churn away from fixed line, which in turn will mean a further increase in ADC per minute if it is collected only from fixed line long distance minutes. Therefore, the Authority should consider a possibility of recovering ADC from a base larger than only the fixed line long distance minutes. Otherwise, there will be an adverse effect on development activities and tele-density objectives for Rural and remote areas

A number of options that have been suggested to address the above-mentioned situation include the following:

- ADC should be imposed on all long distance calls including Cell to Cell, WLL(M) to WLL(M), Cell to WLL(M), WLL(M) to Cell calls of Intra-Circle and Inter-Circle nature. This could be enforced through periodic settlement between operators under the supervision of the

Authority or through the creation of an Access Deficit Contribution Fund.

- The calculation of ADC should also be reviewed to account for the likely developments in the telecom sector, and for this purpose, the Authority should conduct its analysis based on Long Run Incremental Cost, taking account of new cost effective technology options like fiber in the loop, wireless in the loop, switches with high traffic handling capacity, two stage remote switching options, high capacity transmission systems, new equipment deployment options, possible changes in efficient utilization of Numbering resources and traffic handover principles. In this regard, it was also pointed out that most countries have moved to Forward Looking Long Run Incremental Costs (in place of historic costs) for determination of ADC and interconnect charges.

(e) Greater flexibility should be provided in the IUC/ ADC regime with more flexible floors and ceilings

(f) It is necessary to clarify the rationale for specifying a carriage charge of Rs. 0.20 per minute payable for traffic handover to Basic Service Providers within the same Circle while in case of Metros, this component being not payable at all.

(g) The IUC review exercise should ensure that no undue migration of traffic gets encouraged from one network to another network and adequate margins are available for ensuring viability of services with adequate margins. In this regard, it was also pointed out that the ADC for ILD calls is much higher than the maximum ADC for NLD calls. Also, the ADC for ILD calls should be different for different distances that the calls have to travel in the national segment. Higher

ADC especially for Incoming International traffic, as well as differential ADC for calls to cellular mobile and WLL (M), would promote gray market.

(h) It should be ensured that the ADC from long distance calls originating from cellular mobile roamers, is received by the fixed line operator

### **Section C : Tariff Issues**

6. A number of tariff issues were also raised in the context of the IUC regime. These include:

(a) Local call pulse rate for calls from Fixed Line to WLL (M) and Cellular call should be identical since the IUC for such calls is identical.

(b) There is no justification for providing Port Charges subsequent to IUC implementation.

(c) While the tariffs may be on per minute or any other appropriate pulse, the IUC payment should be based on a per second basis.

(d) The number of Tariff Packages need to be restricted to only 4 or 5, for better understanding of the customers and simplicity in implementation.

(e) It is desirable to specify the standard tariffs for cellular mobile and WLL (M) and remove them from the category of tariff forbearance.

(f) The Authority must prescribe the manner in which the customer should be informed about tariffs so that the actual, effective call charge is correctly known to the customer.

## **Section D : Calling Party Pay (CPP) for Cellular Mobile**

7. One of the views submitted to the Authority on CPP is that the introduction of a mobile termination charge increases the tariffs for a basic service subscriber, takes away revenue that is due to the Basic Service Operator, and provides the cellular mobile operator with amounts that should not be given in terms of their overall cost situation in comparison to the Fixed Line.

**Section 4**  
**Issues and Questions for Consultation**

**1. Interconnection Usage Charge**

- i) What are the anomalies or interpretive difficulties in the various schedules of the IUC regulation and TTO of January 24, 2003.
- ii) Transit of calls through a third party network/ switch even for local calls may be required at least as a back up arrangement. Should a transit charge be specified?
- iii) Is there an IUC anomaly in the case of long distance calls involving GSM roamers? If so, how is it to be corrected?
- iv) Should Cell to Cell and WLL(M) to WLL(M) termination charges be defined for all Intra and Inter-Circle calls?
- v) Should the termination charges be made identical for all intra-circle calls across all services?
- vi) Should there be any differences in IUC for Origination and termination covering National Long Distance and International Long Distance segments? Is there any justification for different IUC values based on distance?
- vii) Is there a need to review the national numbering and long distance charging plans?
- viii) Should the carriage charge for long distance calls be revised?

## **2. Access Deficit**

Several comments have been received with regard to the quantum of Access Deficit, the method used for calculating the Access Deficit, the method of compensation proposed for Access Deficit, anomalies with regard to the specific Access Deficit under different situations, etc. Keeping in mind the issues raised in Section 3, following questions have been formulated for consultation:

- i) The requirement of Access Deficit has been worked out on the basis of Cost as contained in the published Annual Reports of BSNL and MTNL, being the companies having the largest share of fixed line customers at the moment. In the light of rapidly evolving technology alternatives should the Access Deficit be continued to be calculated based on the concept of replacement and re-creation of the network or on the basis of re-creation of the functionality of the network? This would require a look at various alternative costing methods such as the Current Cost Model, the Historic Cost Model, the Long Run Incremental Cost (LRIC) Model or Forward looking LRIC (FL LRIC). What are your suggestions in this regard?
- ii) Which target networks should be provided funds to recover Access Deficit? Should these be identified on average basis covering all customer lines or a distinction should be made between the Access Deficit for Urban and Rural connections?



- iii) Should the source of the contribution to the Access Deficit be from calls, which have fixed network either at one end or both ends or the contribution should come from all services? The key issue should be to ensure that no competitive advantage becomes available to any specific services as a result of regulatory intervention.
- iv) Whether some or all providers of fixed line services be recipients of Access Deficit Funds ?
- v) Should the Access Deficit fund collection be minute based or revenue share based? In case per minute basis is adopted for computation of Access Deficit charge, should this amount be uniform for all these services by working out weighted average across individual services based allocation?
- vi) Should the mechanism of transfer of funds be direct operator to operator transfer or through a third party independent administrator?
- vii) Should uniform or non-uniform ADC charge arrangement continue or only one be standardized? In that case, which one?

### **3. Tariffs**

- i) Should the regulator monitor predatory pricing or should the tariffs be left to market forces after ensuring no regulatory advantage to any one type of service over others?

- ii) What should be the principles to ensure that Tariff proposals are consistent with applicable Interconnection Charges.
- iii) Whether the tariff for Cellular and WLL(M) which presently are under forbearance, need a revision.

#### **4. CPP Issues**

- i) Any comments to make implementation of CPP more effective.

**ANNEX I**  
**WRITTEN COMMENTS on IUC Issues**

**Section 1: Comments from incumbent Service Provider**

- a) ADC has not been made applicable for Cell to PSTN and PSTN to Cell intra-circle calls which are basically long distance calls. If a fixed line customer of a BSO calls from Udaipur to a fixed line customer in Ganganagar of other BSO, the originating BSO pays to the terminating BSO at Ganganagar an IUC of Rs. 1.75 per minute whereas, if a cellular subscriber calls from Udaipur to the same fixed subscriber in Ganganagar, the cellular operator pays an IUC of Rs. 0.80 per minute only to the terminating BSO. The distance between calling and called party and the work done by the terminating BSO is same in both the cases. To remove this anomaly between the two type of calls, it is suggested that ADC applicable for 200-500 kms distance slab for fixed to fixed call should also apply for a cell to fixed call.
- b) A mobile subscriber roaming in another circle pays a PSTN termination charge (Rs. 0.80) which is much less compared to a maximum termination charge of Rs. 2.50 if he had made the call from his own circle. This huge difference is being misused by the NLD operators to terminate cell to fixed inter-circle long distance calls through the POIs with other cellular networks in the terminating circle depriving the BSO of genuine termination charge of Rs. 2.50. Even Otherwise, the roamers subscriber belongs to a different service area and cannot claim the same benefit as applicable to the subscribers of the network he is roaming in. In order to prevent such misuse and charge the in roamer subscriber appropriately, it is suggested that the cellular operator shall

pay an IUC to the terminating BSO applicable for highest slab of the inter-circle cell to fixed long distance calls.

- c) Non-uniform termination charge due to its dependence on distance slab for fixed/ cellular networks results in the requirement of analysing CLI of the originating subscriber at the terminating end for determining the applicable termination charge. Wherever CDR based interconnect billing system is not there, the segregation of calls requires different trunk groups to be created at the terminating end which results in inefficient utilisation of the interconnect resources.
- d) IUC Regulation permits forbearance for termination charges payable in case of Cellular to Cellular or WLL (M) to WLL (M) calls whereas it prescribes the termination charges in case of call from fixed to Cellular/ WLL (M) and also from Cellular to WLL (M) and vice versa. This results in cheaper Cellular-to-Cellular or WLL (M) to WLL (M) long distance calls and is thus causing migration of inter-circle long distance traffic of fixed to fixed networks to cell and WLL (M) networks.

Therefore, the purpose of prescribing ADC for compensating the BSOs to provide affordable service gets defeated.

- e) The tariff and IUC are not matching for implementation in respect of inter circle calls terminating in WLL (M) networks. For inter circle calls terminating in WLL (M) network within a distance slab of 50 km the IUC payable by originating access provider to NLDO is Rs. 0.20 + Rs. 0.50 = Rs. 0.70 per minute. The origination charge is Rs. 0.15 thus making minimum cost of call as Rs. 0.85 per minute. As per TTO 2003 the pulse rate for local call including inter circle call within 50 km is 120s.

Thus tariff per minute charged from customers by originating access provider is only Rs. 0.50 (taking average per MCU rate as Rs. 1/-) while the pay out as IUC is Rs. 0.70 per minute.

Similarly, for the local calls within the same SDCAs the termination charge payable by fixed operator to WLL (M) operator is Rs. 0.40 per minute against its revenue of Rs. 0.50 per minute as per the prescribed tariff. Thus, the share of the originating operator is just Rs. 0.10 per minute i.e. about 20% of the call revenue.

To remove the above anomalies, it is suggested that for local calls the WLL (M) operator should get the same termination charge as applicable for fixed to fixed calls.

- f) Termination charges for cellular to PSTN inter circle calls terminating within 50 km is much lower than the termination charge payable for intra circle calls. For intra-circle cell to PSTN calls terminating within the same LDCA, the termination charge payable to the fixed operator is Rs. 0.60 per minute whereas for inter-circle call terminating within 50 km the termination charge prescribed is Rs. 0.15. There is no justification for such a low charge for cell to fixed call. This should be brought at the level of Rs. 0.60.
- g) In addition to above, because of the implementation of the CPP regime a call from fixed telephone to cell phone is required to be charged at a higher rate. This will create inconvenience for the customers.
- h) It is further submitted that the private basic operators are normally providing telephones in the urban areas. Their average rental from fixed

line telephones is of the order of Rs. 250/- per month. Whereas, the average rental of BSNL is Rs. 155/- per month because of the fact that about 30% of the BSNL's telephones are provided in the rural areas which contribute monthly rental of the order of about Rs. 50/- per month only. TRAI has calculated the cost based rental for fixed line services as Rs. 424/- per month though the justifiable cost based rental as per the cost data submitted by BSNL is much higher. Taking the figure of Rs. 424/- per month as cost based rent for fixed lines, the Access Deficit of the private BSO is only Rs. 174/- per month per DEL whereas, the Access Deficit of BSNL is of the order of about Rs. 269/- per month per DEL. In addition, the private BSOs are generally serving high callers. In conclusion, the Access Deficit per month per line in case of private BSOs is much lower than BSNL, the traffic generated by the customers of private BSOs is much higher than those of BSNL. Therefore, the Access Deficit Charge payable to the private BSOs on per minute of inter-circle long distance traffic should ideally be much lower than that what is payable to BSNL. However, as per the IUC Regulation same ADC has been applied to all the fixed line operators which is not justifiable and is causing undue enrichment of the private basic service operators providing fixed line services and is required to be reviewed urgently.

- i) BSNL is forced to provide leased lines to the private BSOs and CMSPs at a very low tariff which was prescribed by TRAI vide its Telecommunication Tariff Order 1999. These leased lines are being used by the private BSOs / CMSPs for delivery of their traffic to various SDCAs/ LDCAs of BSNL. The private operators are normally serving the entire circle from one switch using the leased lines provided by BSNL. These leased lines which have been provided by BSNL at a very

low cost without any profit margin are, thus, being used for converting the long distance calls into the local calls and hence the distance dependent ADC which would have, otherwise, been accrued to BSNL is no more available. It is, therefore, submitted that BSNL should not be forced to provide these leased lines to the private BSOs / CMSPs at the tariff prescribed by TRAI. In case BSNL provides the intra-circle long distance network to any other competing operator, BSNL should be permitted to charge the commercial rates.

- j) To remove some of the anomalies, following alternatives are suggested:-
- i) For intra-circle calls from fixed to cellular networks, no termination charge should be payable by the fixed line operator to the cellular operator. The cellular operator may be compensated by a higher origination/ termination charge from inter-circle long distance calls as well as International calls.
  - ii) The ADC payable to the BSOs should be recovered from all long distance calls i.e. fixed to fixed, cell to cell, WLL (M) to WLL (M) and any other combination thereof.
  - iii) Where at one of the end there is a fixed operator, the entire ADC should be directly payable to the fixed operator.
  - iv) When there are fixed operators on both the ends, the ADC may be divided amongst the fixed operators in proportion to the network cost of the two fixed operators and the applicable deficit because of the difference between the costs based rental and the actual rental being realised by each BSOs.

- v) In case of cell / WLL (M) to cell / WLL (M) inter-circle long distance calls, the same amount of ADC should be made applicable. This ADC should be recovered from the long distance operator by the TRAI and should be distributed amongst the fixed line operators in proportion of their deficit on account of lower rentals and local call charges.
  - vi) Similarly, ADC should be recovered from incoming and outgoing international calls terminating and originating from Cellular / WLL (M) networks and should be distributed as indicated above.
  - vii) There should be a floor for inter-circle STD calls and ISD calls for all segments of distances. This should include the origination charge, termination charge, carriage charge and the ADC.
- k) While reviewing the IUC, the efforts in the direction of modified IUC should be aimed at:
- i) That the fixed line operators are adequately compensated for providing the basic telephone services at affordable rental and lower local call charges with a view to keep them within the affordable limits of a common man and enhance the tele-density in rural and urban areas to achieve the targets as envisaged in NTP-1999.



- ii) That there is no undue migration of traffic from one network to another network.
- iii) That the tariffs are sustained at certain minimum levels to ensure viability of the telecom service providers.
- iv) That the tariffs plans are simpler to implement and understandable by the customers.
- v) That the customers are not put to any undue inconvenience because of the differential charges applicable for different type of networks.
- vi) That enough margins are available for competition in services.

## **Section 2: Comments from Association Basic Service Providers**

### **a) Introduction of Calling Party Pays (CPP) Regime**

The IUC Regulation has introduced the regime of Calling Party Pays (CPP) and this has been mentioned in the regulation itself. Now, through the IUC regulation the TRAI has given cellular operators a mobile termination charge which will have to be paid by the Basic Service consumers. This not only places an unjustified and huge burden on the basic subscribers but also makes tariffs of basic services less affordable. In effect, this means that basic subscribers are subsidizing cellular subscribers. It is surprising to say the least that in a country like India where maintaining affordability of basic telephony

itself is a complicated and sensitive task, a huge burden is imposed on 4 crore basic subscribers rendering basic services totally unaffordable in the process.

There was strong opposition from consumers and TRAI's first attempt on CPP was subsequently quashed by the Delhi High Court. Two years later, in 2001, the TRAI again issued a consultation paper on CPP attempting to reintroduce CPP. Once again the process of Open House discussions was followed and the last such discussion was held in November 2001. It was evident from the responses in these open houses which was widely reported by the media that the entire country including some of the large cellular operators themselves that introduction of CPP was not desirable.

Already, cellular operators have been registering a growth of 80 - 100% every year and are continuing to grow at an unprecedented rate. Such growth does not require any additional incentive in the form of CPP. Cellular tariffs have come down due to increased competition and reduced costs in the sector. Introduction of CPP/ MTC is therefore an arbitrary decision and has no basis.

Mobile Party Pays (MPP) regime which is in existence in US, Singapore, Australia and China has been successful in India and should be allowed to continue. The concept of CPP /MTC is not just against the objective of NTP'99 but will also have a negative impact on the growth of Basic Services.

Even the tender for Basic and Cellular Services issued in 1995 demonstrated the intent of the licensor that BSOs require access charges to be paid to them whereas CMSPs who have a cost plus tariff model are not entitled to access charges. No justification has been offered as to why this extra burden of calling needs to be imposed on basic subscribers. There is no explanation as to why cellular network continue to charge airtime and yet be entitled to MTC.

**b) Applicability for ADC for intra circle long distance calls from Cellular to Fixed line**

ADC must be paid to basic operators from every long distance call in order to ensure sustainability and viability of the Basic services. To ensure this, the IUC regime recovers ADC from various types of long distance calls -- both intra circle and intercircle. However, there is no payment of ADC by cellular operators in case of intra circle long distance calls from a mobile network to a basic network. In contrast, a similar intra circle long distance call from a basic network to another basic network attracts ADC. This is a clear anomaly in the IUC Regulation in as much as Schedule - I of IUC regulation prescribes payment of ADC on all long distance calls, yet Schedule - III & IV are diluting it to exempt CMSPs from paying any ADC on calls from cellular networks which originate or terminate in basic network. The above anomaly has a serious impact on the viability of the basic operators and distorts the level playing field in favour of cellular operators.

**c) Bypass of intra circle long distance call revenue**

The basic operators have made several representations to TRAI on the issue of bypass on long distance traffic by cellular services over the last few years resulting in loss of several thousands crores to Basic Service Operators. This has happened on account of the peculiar numbering plan of cellular operators is not just in non-conformance with the SDCA linked Numbering Plan but is also a serious breach of the National Numbering Plan of the country.

Apart from this, the cellular numbering plan has caused enormous financial damage to basic operators because it permits easy bypass of intra-circle long

distance traffic. We urgently impress upon the TRAI to rectify this very serious anomaly. The bypass issue can be easily addressed by simply adding a "0" before the existing cellular numbers for all calls outside an SDCA.

**d) Applicability of ADC for calls by GSM roaming subscribers**

The issue highlighted in point "b" above on applicability of ADC for calls from GSM subscribers becomes further complicated when applied to a roaming cellular subscriber. For e.g., when a Delhi mobile subscriber roams to Mumbai and makes call to a land line in Delhi, the termination charge payable to fixed line operators will not include ADC. The reason for this is that the mobile subscriber is roaming freely with the same number and it is not possible to calculate distance based ADC in such a case of roaming. This issue can be addressed by applying uniform ADC for all calls originating from cellular network and terminating into fixed network irrespective of the distance.

**e) Cellular to WLL(M) intra circle calls - Enforcement of IUC Regulation**

As per IUC regulation, the termination charges for calls terminating into WLL(M) network is Rs. 0.30 per minute (metro) and Rs. 0.40 per minute (circle) for local call and Rs. 0.50 per minute for intra circle calls. However, due to the existing numbering plan of cellular operators, which does not conform to the national SDCA based numbering scheme, it is not possible to differentiate between local and intra circle calls for a cellular originated call. This issue can be addressed by adopting an SDCA based numbering plan for all operators including cellular and applying uniform ADC for all intra circle calls originating from cellular network and terminating in fixed network irrespective of distance.

**f) Need for removal of Port Charges**

TRAI has stipulated Port Charges for interconnection vide notification dated 28/12/01. These charges are based on the cost for all elements involved in the interconnection. In the present IUC regulation 2003, since the IUC charges are arrived based on all cost elements involved in the calls, payment of port charge impose double charging for the same call. This needs immediate rectification.

**g) Pulse rate for reconciliation**

The IUC regulation mentions rates on per minute basis. However, there is ambiguity regarding pulse rate for another operator's reconciliation (per minute or per second). This can have a serious impact on the pulse rates charged by access providers in their retail tariff.

**h) IUC charges for SMS**

Though the IUC regulation does not specify any charge for exchange of SMS between two operators, cellular operators are insisting on payment of IUC charges for SMS. This is absurd since the cellular operators themselves are actually using the CCS7 signalling network of BSNL for exchange of SMS. This needs to be rectified immediately.

**i) Uniform ADC versus Differential ADC**

The concept of uniform / differential ADC has the potential to cause quite a lot of confusion in the market. Multiple operators in the same circle can start adopting different ADC charging principles. As can be understood, this will result in not just

consumers having to pay different tariffs for same distance calls depending on terminating operators - it will also lead to chaos.

### **Section 3: Feedback from a standalone Basic Service Provider**

- To apply a consistent basis of POI billing for incoming & outgoing calls, either call by call using a uniform pulse value or cumulative time basis.
- To apply a consistent principle of specifying originator's share in domestic and international long distance calls.
- Not to charge the carrier share's in case of intra-circle calls terminating to its cellular subscriber.
- Where the tariffs are below IUC, the originating, carriage and terminating charge should be reduced on pro rata basis.
- Some permanent solution may be found.
- The long distance traffic pattern is shifting in favor of WLL and cellular as long distance from wire line has become more expensive.
- Favoring rich subscribers at the cost of poor subscribers and also favoring urban at the cost of rural. BSNL and other BSOs will become financially not viable.
- PCO segment has been severely affected.
- ADC fund may be created and NLD,ILD,WLL & CMSP operators contribute to this fund.
- The excess of cost and tariff is contributed to ADC fund by NLDO.
- The contributions of ADC fund to be distributed on equitable basis amongst all BSO based on the number of fixed subscribers.
- An uniform ADC or even differential ADC is not the right solution.
- The bundling of Access and long distance should be disallowed.
- TRAI may fix floor pricing on long distance tariffs uniformly for all operators, which should be IUC compliant. .CMSPs should be allowed to

charge air time extra. TRAI may fix long distance tariffs considering the deficit element for BSO.

#### **Section 4: Feedback from a Cellular Service Providers**

- The retail tariff should be equal to or higher than the sum of IUC charges of Origination, Carriage and Termination of a call.
- This principle should apply both for peak and off-peak tariff.
- Service Provider may fix a lower off-peak tariff in consultation with the other Service Providers involved in end-to-end completion of a call subject to the concerned operators mutually agreeing to accept the lower IUC charges payable for origination, carriage and termination.
- TRAI may approve the above tariff only after getting the report from Service Provider who files the tariff regarding the agreed lower share of IUC between the service providers
- Access Providers instead of NLDO should set NLD tariff.
- If the retail tariff is lower than the sum of IUC (due to market competition), Service Provider who sets the tariff should bear the difference between IUC and retail tariff unless mutually agreed between the various Service Providers involved.
- The principle of consistency with IUC, non-predation and non-discrimination must be followed while approving the tariff.
  - In case, where the difference between the IUC cost and the retail price should be absorbed by the concerned NLDO.
  - Off-peak tariffs which are below the IUC cost may be reviewed.
  - The difference between the off-peak tariff and the IUC cost shall be absorbed uniformly by the originator, carriage and terminating network.

## **Section 5 : Feedback from Association : Cellular Service Providers**

- Tariff must be cost based.
- Tariff package should be IUC compliant.
- Any tariff less than –10% of IUC value is below cost.
- Tariff below IUC would affect competition and growth of the telecom industry.
- IUC cost should be included in retail tariff to ensure no service provider could offer predatory prices or have discriminatory network interconnection deals.
- TRAI must ensure that all service providers must file component-wise tariffs.
- The billing of end users vs billing for interconnecting operators may be different. The component-wise should not be billed to consumers. The accounts of interconnecting operators should be unbundled.
- The unbundling, if mandated by TRAI, will provide cushion to those operators who lack market power and are at the mercy of integrated players.
- The principle of cost based, IUC complaint should be applied both to peak and off-peak tariff.
- Service Provider may fix a lower off-peak tariff in consultation with the other Service Providers involved in end-to-end completion of a call subject to the concerned operators mutually agreeing to accept the lower IUC charges payable for origination, carriage and termination.
- TRAI may approve the above tariff only after getting the report from Service Provider who files the tariff regarding the agreed lower share of IUC between the service providers.
- Access Providers instead of NLDO should set NLD tariff.
- BSNL tariff should be IUC compliant.



- Calculation given by TRAI in Annexure-I is based on uniform ADC, but BSNL is actually implementing inter-network calls on the basis of differential ADC.

## **Section 6: Feedback from an Integrated Service Provider**

### **a)**

- Access provider should be allowed to devise its own NLD tariffs.
- NLD tariff should be IUC compliant. If NLDO decides tariff, which is below the floor prescribed by IUC, NLDO should bear the deficit .
- To fix a time limit for finding a regular solution. Interim period should not be longer than three months.
- For the interim period, in those slabs where the tariff is below IUC, the origination, carriage and terminating charges should be reduced on a pro-rata basis.
- The option of uniform ADC may be withdrawn.

### **b)**

- The call tariffs under particular tariff plan should be looked in totality and on call by call charge basis.
- The apprehension that standalone operators will retain less money and in a disadvantageous position as compared to integrated player is baseless.
- The regulator should ensure that all operators to follow the principle of non-discrimination.
- If a integrated player offers the same carriage rates to all access providers as offered to its own access division, the standalone operators have a level playing field
- To ensure that integrated operators including incumbent maintain accounting separation in transparent manner.

- In a situation where tariff is below IUC , various alternative solutions are considered on interim basis.
- Long distance IUC carriage rates, especially for short distance carriage are not cost based.
- Due to cellular subscriber's roaming with the same number, it is not possible to calculate distance based on ADC in case of roaming.
- Need for removal of Port Charges.
- IUC rates are per minute. However there is ambiguity regarding the applicable pulse rate for inter-operator reconciliation(per minute or per second)
- IUC regulation does not cover charges for SMS exchange between two operators.
- IUC regulation takes away the flexibility of negotiating IUC rates by stipulating that spot IUC rates to be within +/-10% for long distance calls beyond 50 kms involving fixed line.
- **c)**
- The principle of cost based tariff should be followed.
- Tariff package should be consistent with IUC.
- The retail tariff should not be lower than IUC.
- For cases where the origination charges are forborne, the termination and carriage charges defined in IUC could be used for determining the floor.
- In most cases interconnection charges do not cover the costs of the operators. The stand-alone operators would find it impossible to exist within the industry and only incumbent operators could continue.
- In case non-IUC compliant tariffs are to be implemented, operators, such as the incumbent, offering such tariffs do not require the additional subsidization through prescribed ADC.
- The recent tariffs announced by BSNL is an example which lead a stand-alone basic operator to run the business on losses in a number of cases.

- In almost all scenarios there is a shortage of recovery of IUC in the tariffs. In some cases the shortage is less than 10% margin for negotiation, while in others it exceeds even this margin.
- An interim measure , which does not fulfill the minimum IUC charges should not be permitted to be implemented as this shall defeat the entire purpose of the IUC Regulation.

### **Section 8 : Feedback from an ILD Operator**

- IUC notification 2003 lays down the foundation of charges for origination, carriage and termination
- IUC is on the basis of cost.
- Tariff orders are aimed at protecting consumers interest and for the growth of Telecommunication industry.
- Margin provided on IUC spot rate would encourage operators to build more efficient network and to become more competitive in the international market.
- Discriminatory interconnection agreements must be discouraged.
- In the telecom value chain of a call, the largest value is provided by the operator in whose network the call originates. The origination of traffic and the growth of revenue for the entire chain is at the hand of originating operator.
- If the originating operator decides to operate at a price lower than the values of IUC, originating operator may be blamed for this. The terminating and carrier operators are no hands in discounting of tariff.
- If the situation of out of pocket payment arises, it is restricted to the operator who decides to lower tariff below cost level on basis of IUC.

**TABLE 1****STD call charge for Fixed to Fixed Calls**  
**(call duration of 1 minute and pulse charge Rs.1.20 per metered call)**

Distance Category	Peak Tariff envisaged at end of Tariff Rebalancing under TTO 1999 (1 <sup>st</sup> April, 2002)	Prevailing rate at present		%age reduction	
		Intra Circle	Inter Circle	Intra Circle	Inter Circle
Upto 50 Kms	1.2	1.2	1.2	Nil	Nil
51 - 200 Kms	4.8	2.4	2.4	50%	50%
201- 500 Kms	10.8	2.4	4.8	78%	56%
501 - 1000 Kms	16.8	2.4	4.8	86%	72%
>1000 Kms	21.6	2.4	4.8	89%	78%

**TABLE 2****Access Deficit Estimation**

<b>No. of fixed subscribers</b>	40 million
<b>Average cost based rental</b>	Rs. 425 per month
<b>Average rental actually charged</b>	Rs. 200
<b>Deficit per fixed phone per month</b>	Rs. 225
<b>Annual deficit</b> <b>Per fixed line</b>	Rs. 225x12 = Rs.2700
<b>Annual deficit on account of rentals for 40 million Fixed subscribers</b>	Rs. 10,800 Crore
<b>Average number of free calls 30 per subscribers per month</b>	Rs. 1440 Crore
<b>Deficit on this account</b>	
<b>Deficit on account of below cost calls between 0 to 50 Kms (706 calls per subscribers per year. Per call deficit 25 p per call</b>	Rs. 750 Crore
<b>Total Annual Access deficit estimate</b>	Rs. 13,000 crore

**TABLE 3**

**ADC component for various type of Inter-Network Calls**

<b>Total ADC in Rs per Minute as per January 2003 notification</b>						
		<b>Intra Circle</b>		<b>Inter Circle</b>		
<b>Type of call</b>	<b>Local (including upto 50 kms)</b>	<b>50 to 200 KMs</b>	<b>Above 200 Kms</b>	<b>50 to 200 Kms</b>	<b>200 to 500 Kms</b>	<b>Above 500 Kms</b>
<b>F to F</b>	0.00	1/00	2.50	1.00	2.50	4.00
<b>F to W</b>	0.00	0.50	1.25	0.50	1.25	2.00
<b>W to F</b>						
<b>F to C</b>	0.00	0.00	0.00	0.50	1.25	2.00
<b>C to F</b>						
<b>W to C</b>	0.00	0.00	0.00	0.00	0.00	0.00
<b>C to W</b>						
<b>W to W</b>						
<b>C to C</b>						

**TABLE 4**

**ADC on International Long Distance Calls**

<b>Origination / Termination</b>	<b>ADC for ILD In Rs. Per Min</b>
Fixed	5.00
WLL (M)	0.00
Cellular	0.00

**TABLE 5**

**Illustrative IUC Charges for different type of calls**

<b>(INTER CIRCLE)</b>								
	<b>&gt; 500 Kms</b>		<b>200 - 500 Kms</b>		<b>50 - 200 Kms</b>		<b>0 - 50 Kms</b>	
	<b>Uniform ADC</b>	<b>Non uniform ADC</b>	<b>Uniform ADC</b>	<b>Non uniform ADC</b>	<b>Uniform ADC</b>	<b>Non uniform ADC</b>	<b>Uniform ADC</b>	<b>Non uniform ADC</b>
<b>F - F</b>	5.10	6.10	4.75	4.25	4.45	2.45	0.50	0.50
<b>F - W</b>	3.60	4.10	3.25	3.00	2.95	1.95	0.85	0.85
<b>F - C</b>	3.50	4.00	3.15	2.90	2.85	1.85	0.75	0.75
<b>W - F</b>	3.60	4.10	3.25	3.00	2.95	1.95	0.85	0.85
<b>W - W</b>	2.10	2.10	1.75	1.75	1.45	1.45	1.20	1.20
<b>W - C</b>	2.00	2.00	1.65	1.65	1.35	1.35	1.10	1.10
<b>C - F</b>	<b>3.50</b>	<b>4.00</b>	<b>3.15</b>	<b>2.90</b>	<b>2.85</b>	<b>1.85</b>	<b>0.75</b>	<b>0.75</b>
<b>C - W</b>	2.10	2.00	1.65	1.65	1.35	1.35	1.10	1.10
<b>C - C</b>	1.90	1.90	1.55	1.55	1.25	1.25	1.00	1.00

**Note:**

1. WLL(Termination) = 50 Paisa/ Min
2. WLL(Origination) = 50 Paisa/ Min
3. Cellular(Origination) = 40 Paisa/ Min
4. Cellular to Fixed termination charge  
= 50 Paisa beyond 50 Km and 15 Paisa up to 50 Km
5. Fixed origination for calls to cellular = 50 paisa
6. WLL(M) to fixed IUC charges are based on IUC Regulation Schedule-I,  
with Schedule V being applicable only for intra SDCA calls.



**TABLE 6**

**Illustrative IUC Charges for different type of calls**

<b>(INTRA CIRCLE)</b>								
	<b>&gt; 500 Kms</b>		<b>200 - 500 Kms</b>		<b>50 - 200 KMs</b>		<b>0 - 50 KMs</b>	
	<b>Uniform ADC</b>	<b>Non uniform ADC</b>	<b>Uniform ADC</b>	<b>Non uniform ADC</b>	<b>Uniform ADC</b>	<b>Non uniform ADC</b>	<b>Uniform ADC</b>	<b>Non uniform ADC</b>
<b>F - F</b>	5.10	4.60	4.75	4.25	2.45	2.45	0.70	0.70
<b>F - W</b>	3.60	3.35	3.25	3.00	1.95	1.95	0.95	0.95
<b>F - C</b>	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
<b>W - F</b>	3.50	3.25	3.15	2.90	1.85	1.85	0.85	0.85
<b>W - W</b>	2.00	2.00	1.65	1.65	1.35	1.35	1.10	1.10
<b>W - C</b>	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
<b>C - F</b>	<b>1.20</b>	<b>1.20</b>	<b>1.20</b>	<b>1.20</b>	<b>1.20</b>	<b>1.20</b>	<b>1.20</b>	<b>1.20</b>
<b>C - W</b>	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
<b>C - C</b>	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80

**Note:**

1. WLL(Termination) = 40 p (For same SDCA) and 50 p (For inter-SDCA)
2. WLL(Origination) = 40 p
3. Cellular(Origination) = 40 p
4. WLL to Fixed termination charge = 60 p (For same SDCA) and 50 p (For Inter-SDCA)
5. Fixed origination charge for calls to Cellular = 60 p
6. WLL(M) to fixed IUC charges are based on IUC Regulation Schedule-I with Schedule V being applicable only for intra SDCA calls.

## **ANEXO 6**

Consultation Paper on Unified Licensing for Basic and Cellular Services dated July 16, 2003 (the “Unified Licensing Consultation”).

<http://www.trai.gov.in/consultation.htm>

Consultation Paper No. 3/2003



**TELECOM REGULATORY AUTHORITY OF INDIA**

**Consultation Paper**

**on**

**Unified Licensing for Basic and Cellular Services**

**New Delhi**

July 16, 2003

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## **Annexures ( I to VI)**

# Preface

Owing to technological developments, reduction in cost of wireless technologies, quicker roll out, and growth of wireless subscribers, the present arrangement of separate licensing and regulatory framework for Basic and Cellular Services needs a review. A Unified license for wireline and wireless services (including Cellular Mobile) would provide greater efficiency as a result of optimum sharing of infrastructure and resources. Such considerations of efficiency that would bring down the cost of providing services have arisen the need for consulting the stakeholders on creating a Unified Licensing framework. Internationally, several countries have moved/ are in the process of moving from a service specific license to a Unified License.

In India, Basic and Cellular Mobile Services have been licensed separately. While a significant amount of unification in terms of license conditions has already taken place i.e., in terms of annual license fees, providing mobility (though to different extent), access to Universal Service Obligation Fund etc., there still exist certain differences on issues such as varying amounts of entry fee paid, spectrum allocation etc that needs further discussion. This consultation paper aims to raise such existing issues that arise while considering the framework for migrating from a present service specific to a Unified license framework. It also raises certain policy and regulatory issues that would arise in the future as a result of a unified license.

One immediate need would be to examine the efficiencies as well as the extent of dominance that such a framework would create in the markets. Mergers and Acquisition have been quite common in the industry over the recent years. However, intra-circle Mergers, which are of a horizontal nature have not been permitted. Creation of a unified license would result in a large number of players offering the same basket of services, necessitating consideration of mergers and acquisitions. However, it is extremely important that under no circumstances such events should result in substantial lessening of competition. The paper analyses the issues that arise inter-alia and calls for the comments & suggestions of the stakeholders.

I am quite hopeful that this paper would provide the necessary platform for discussing this important issue of Unified Licensing and would enable us in creating a common framework for offering wireline and wireless services (including cellular mobile services). The consultation paper has already been placed on TRAI's website ([www.trai.gov.in](http://www.trai.gov.in)).

I request that written comments on this Consultation Paper may please be furnished to Secretary, TRAI by 7<sup>th</sup> August 2003. For any further clarification on the matter, Secretary TRAI or Adviser (MN) may be contacted at [trai07@bol.net.in](mailto:trai07@bol.net.in) (Ph No. 26167448) and [jsengg@bol.net.in](mailto:jsengg@bol.net.in) (Ph No. 26106118) respectively.

(Pradip Bajjal)

Chairman, TRAI

### 1.10 Introduction

1.1.1 The development of technologies, reduction in wireless technology costs and the growth of these services has led to blurring of difference between different conduit systems such as wireline and wireless and has eventually led to the concept of unified licensing for basic and cellular services. The operation of various services are able to use their infrastructure to deliver services reserved for other operators and thus ensure optimum use of infrastructure.

1.1.2 The concept of unified license for wireline and wireless services including cellular mobile services is prevalent in a number of countries including Australia, Singapore, Malaysia and some EU countries. With the implementation of the recent EU directive dated 7<sup>th</sup> March 2002, most of the European Union countries would be migrating to a unified license for wireline and wireless services including Cellular Mobile Services..

1.1.3 The Objective of this consultation paper is to examine the various licensing, regulatory and level playing field issues in enabling a Unified License for basic and cellular services.

This consultation paper consists of five chapters. Chapter 1 describes the objective of this consultation paper, brief background on licensing issues and the need for unified licensing of basic and cellular services. Chapter 2 discusses the terms and conditions of both basic and cellular service's license agreements, which are to be addressed while deliberating the issue of unified licensing. These terms and conditions include inter alia entry fee, service area, level of interconnection with other networks, roll out obligations, spectrum charges, etc. Chapter 3 discusses the practices on unified licensing in some other countries. In case unified licensing for

basic and cellular services is considered acceptable then in view of larger number of licensees providing the same basket of services, there may be a need of considering merger and acquisition of the service providers in the same service area. This, however, does not imply that without unified licensing, merger within the same service area should not be permitted. This leads to the issues related to merger and acquisitions, which are discussed in Chapter 4. This consultation process raises various issues for consideration and they are listed in Chapter 5.

1.1.3 All the stakeholders are being requested to give their opinion on these issues through this consultation process.

## **1.2 Background**

1.2.1 With the formulation of the National Telecom Policy in 1994, the Basic and Cellular Mobile Services were opened to the private sector participation. Licenses were awarded to private operators through a tendering process for operating in a duopoly for ten years.

### 1.2.2           2.1   First phase of licensing: Monopoly to Duopoly

In the case of Basic Services, one private operator was envisaged to be licensed in every Circle. However, owing to various reasons such as very high bid amount in some cases and certain legal issues, only six licenses could be granted in Basic Services i.e., for the Service Areas of Andhra Pradesh, Gujarat, Madhya Pradesh, Punjab, Rajasthan and Maharashtra. The annual license fee in these cases was decided through a bidding mechanism.

1.2.2.1           In Cellular Mobile Services, duopoly was introduced through a bidding process and forty-two licenses were awarded to private operators for operating Cellular Mobile Services. In some service areas like, Bihar, West-Bengal and Orissa only single CMSP license could be awarded. In case of CMSPs, four metros (Chennai, Delhi, Kolkatta and Mumbai) were designated as separate service areas and were excluded from the Circles. The policy stipulated that the technology used for Cellular Mobile must be digital GSM standard.



### 1.2.3 Second Phase of licensing: Duopoly to open competition / Multi-operator

Due to various reasons a need for new telecom policy was felt, and a New Telecom Policy was announced in 1999. The second phase of licensing started with the formulation of the New Telecom Policy in 1999 (NTP '99). The existing Basic and Cellular Service providers were offered a migration package under NTP'99, allowing them to migrate from an annual fixed license fee to a revenue share arrangement. The amount of licence fees due till 31.7.99 were taken as entry fees. Further, it was decided to have more competition in these services, and one of the conditions of acceptance by the licensee of the terms and conditions contained in the offered migration package, was that the licensee had to forego the rights of operating in the regime of limited number of operators after 1.8.1999 and shall operate in a multipoly regime, that is to say that the licensor may issue additional licenses for the service without any limit in the service area. In the area of Cellular, it was also decided by the government to allow BSNL / MTNL to provide Cellular Services as the third operator. Based on recommendation of TRAI, Government decided to allow one more private operator as the 4<sup>th</sup> Cellular Mobile Service Provider in each Service Area. The number of cellular operators were restricted to four (including BSNL/MTNL) due to limitation availability of the spectrum. The 4<sup>th</sup> operator was given spectrum in 1800 MHz band. TRAI vide its letter dated February 20, 2003 had opined that it is in favour of open competition in the different segments of Indian Telecom market. Further, TRAI in the same letter stated that induction of additional mobile service providers in various service areas can be considered if there is adequate availability of spectrum for the existing service providers as well as for the new players, if permitted. The salient features of basic and cellular service license agreements are given in **Table 1**.

**Table 1.1**

The main features of the present guidelines/ license agreements are tabulated as under:

	<b>Basic Service Operators</b>	<b>Cellular Mobile Operators</b>	<b>Comments</b>
<b>Entry fees *</b>			
<b>License before NTP'99</b>	Amount of license fees due till 31.7.99	Amount of license fees due till 31.7.99	
<b>New License</b>	The amount specified in the license varies from Rs 2 Crore to Rs 115 Crores depending on Service Area(see <b>Annexure I</b> for details)	Decided on the basis of multi layered bidding process. Varies from Rs. 1 Crore to Rs. 206 Crore (see <b>Annexure I</b> for details)	
<b>Annual license fees</b>			
	8% (Category C circle), 10% (Category B circle) and 12% (Category A circle) of Adjusted Gross revenue	8% (Category C circle), 10% (Category B circle) and 12% (Category A circle and Metro) of Adjusted Gross revenue	Initially after the implementation of NTP'99 License fee for CMSOs was 15% of Adjusted Gross revenue but was reduced to the amount mentioned in this table, when BSOs were permitted to provide limited mobility w.e.f. 25.01.01
<b>Number of players</b>	From duopoly to open competition	From duopoly to four players including BSNL/MTNL per Service Area on the basis of bidding for the 4th operator.	
<b>Mobility</b>	Permitted to provide limited mobility within SDCA	Permitted to provide all types of mobile services.	

	Basic Service Operators	Cellular Mobile Operators	Comments
<b>Roll out obligation and Universal Service Obligation</b>			
<b>Old Licenses</b>	License conditions stipulates VPT obligations No. of DELs.	50% of DHQ which was changed to 50% DHQ or any town in lieu of DHQ	Universal Service Obligation to be funded separately through USO Fund and the Service Providers now have an opportunity to obtain a portion of their costs.
<b>New Licenses</b>	Roll out plan SDCA wise including coverage of specified rural/ Semi-urban / Urban SDCAs	In Metros, 90% of the service area shall be covered within one year of the effective date. In Telecom Circles, at least 10% of the District Headquarters (DHQs) to be covered in the first year and 50% of the District Headquarters to be covered within three years of effective date of Licence	
<b>Spectrum Upto</b>			
<b>Allocated Spectrum</b>	5 + 5 MHz for Wireless access	4.4 + 4.4 MHz extendable upto 10+10 MHz	
	Long Distance network in service area permitted. Direct Inter circle interconnection not permitted.	Long Distance network in service are permitted. Direct interconnection across circle is not permitted.	

\* BSNL/MTNL have not paid any entry fee

### 1.3 Need for unified license for basic and cellular mobile services

#### 1.3.1 Convergence of wireline and wireless technologies

Over the last few years owing to technological developments and a reduction in costs, wireless telephony has changed from being a product for the elite to that for a common man. In about 120 countries, the number of wireless phones have already exceeded that of wireline. The cost of establishing a wireless network has become significantly lower than the wireline line, encouraging even the incumbents to adopt roll out strategies based on wireless, as can be seen from the provision of WLL with limited mobility i.e. WLL(M) as well as GSM by both BSNL and MTNL.

Internationally, there is a general move towards convergence/unification of licenses and technology neutrality. In Australia, there is already a common service license for wireline and wireless services including Cellular Mobile Services.. However, for acquiring spectrum, an operator has to undergo an auction process. In the EU countries, there is now an EC Directive that mandates abolishing of Service Licenses and envisages an authorization which would allow provision of any telecom services..... Another example is Malaysia, where the existing Service Specific Licenses have been migrated to a new structure of layered licenses, wherein wireline and wireless services including Cellular Mobile services can be provided by the same license.

1.3.2 In India, prior to liberalization, fixed WLL technologies such as MARR had been deployed in the local loop by BSNL. These technologies did not have the flexibility of providing mobility. Over time, cellular technologies are also being used for local loop. This has happened owing to the economies of scale and rapid decline of cost per line. Most of the BSOs in India deployed IS-95 based WLL systems. Though these systems were capable of providing mobility, this was not allowed as hand held subscriber terminals for WLL were not allowed as a regulatory restriction.

1.3.3 In 2001, the government permitted the BSOs to provide limited mobility. The BSOs have now deployed CDMA 2000 1x technology, which is capable of providing high speed data access as well. Even prior to 2001, Wireless in Local Loop (WLL) was permitted and no specific technology was mentioned in the license conditions. Between the period March 1998 and 2001 Four BSOs (M/s Tata Teleservices in Andhra Pradesh, M/s HFCL in Punjab, M/s Shyam in Rajasthan and M/s Bharti Telenet in Madhya Pradesh) had deployed WLL technologies in their network based on MSC architecture. Even on the Switching side, a number of hybrid switches have emerged which can carry out both the tasks i.e. wireline and wireless switching. Such technological convergence has challenged the basis for the two different regulatory frameworks. There is thus a situation based on technological developments where the country needs to prepare for the future and adopt regulatory regimes that are supportive and not obstructive of the change of technologies.

## **1.4 Overlap of Competition:**

1.4.1 Basic (wireline and wireless) and cellular services are now competing with each other. With greater deployment of wireless technologies, competition between Basic and Cellular Mobile Service providers is becoming severe and this market overlap is increasing. Moreover, ongoing technological changes are making it possible for wireline technologies to provide value added services which were earlier not feasible. The availability of low price prepaid cards for both services will further expedite the overlap between these two services.

1.4.2 While this competition is increasing, the license and tariff structure is such that a regulatory limit, for reasons of affordability, has been prescribed for local calls and monthly rentals only for Basic Services. Thus a situation is emerging that while competition among services (technologies) is increasing, their applicable tariff regimes have different conditions.

## **1.5 Consumer benefit**

A unified license for Basic and Mobile services could benefit the consumer in a number of ways, as he would be able to:

- subscribe to telecom services at a lower price because of reduction in costs due to economies of scale
- have a single window solution for various kinds of services, including common customer care number.
- receive a common bill,

## **1.6 Optimum Sharing of infrastructure and generating efficiencies**

1.6.1 The experience from the other countries shows that overbuilding of capacities can have an adverse impact on profitability and sustainability of operations. It is extremely important for India to avoid duplication of efforts and build efficiencies through a synergy of the existing networks. The introduction of unified licensing would result in reduction of costs as the operators would be able to optimally utilize available resources. The reduction in cost would in turn lead to improved teledensity. The emerging trend of Mergers & Acquisitions to build such efficiencies can now be seen. A common license for both these services would further enhance these efficiencies.

1.6.2 However, it is important to ensure that such efficiencies do not result in market dominance, which in turn may result in substantial lessening of competition. Adequate safeguards would, therefore, have to be built through competition guidelines.

### **1.7 Provisions of Limited Mobility Service by Basic Service Operators:**

Government has permitted the offering of limited mobility service by basic service operators within the local area i.e. Short Distance Charging Area (SDCA). Cellular Mobile Service Providers (CMSPs) had challenged Government's decision of allowing limited Mobility to Basic Service Operators. CMSPs had already raised issues relating to level playing field between CMSPs and BSOs offering limited mobility services. This issue is under consideration of Hon'ble TDSAT.

### ***Key issues in implementing Unified Licensing***

2.1 Currently, separate licence agreements have been signed by Basic Service Operators (BSOs) and Cellular Mobile Service Providers (CMSPs) for these services. Differences among these two licence agreements arise in terms of entry fee, rollout obligations, spectrum allocation & its charges, and terms and conditions of inter-connection. These differences are given in Annexure II.

2.2 For implementation of a unified licensing framework for basic and mobile services, the key issue would be the migration of existing licensees (presently with different terms and conditions) to a single license with common terms and conditions.

2.3 As per the present Basic and Cellular license Agreement, the licensor reserves the right to modify at any time the terms and conditions of the license, if in the opinion of the licensor it is necessary or expedient to do so in public interest or in the interest of security of the State or for the proper conduct of the Service/telegraphs. The decision of the Licensor shall be final in this regard. Additionally, it could be considered that choice of migration to the unified licensing regime is given to the service providers. The detailed terms & conditions of migration package will be required to be worked out. In making the changes it is important to ensure that the migration to the new regime does not lead to a situation that a licensee is treated less favourably as compared to another licensee.

The license conditions of different licenses have been modified from time to time in public interest and for proper conduct of the telecom services. Beginning 1.8.99, both BSOs as well as CMSPs were migrated to the new regime of licence fee. In 2001 the Basic Service Providers were permitted to use hand held subscriber set within the local areas (SDCA) as WLL-Limited Mobile. The amendment dated 25<sup>th</sup> September, 2001 to the old CMTS license agreement, permitted the CMSPs to provide “Fixed Phones” based on existing GSM cellular network infrastructure in their Licensed Service area. Under the unified licensing regime, the above mentioned CMTS license conditions need to be modified to the extent that the choice of the

technology is left to the service provider. The Cellular Mobile Service Providers were also permitted to use mobile PCOs. The annual revenue share license fees, which was higher for mobile services, was brought down to level of Basic Services i.e., at 8%, 10% and 12% for Category C, Category B and Category A Circles respectively. Also, the CMSPs were allowed to retain 5% of the long distance call charge.

2.4.1 In addition to Basic and Cellular services, licenses of other services have also been modified from time to time, in order to ensure effective competition so that the benefit of technological developments flows down to consumers. For example, in the case of Internet services, the Internet service providers were permitted to provide Internet telephony services. Similarly the access providers were permitted to handover the calls directly to the ILD service providers.

2.4.2 Regarding tariffs, tariffs are forborne for Cellular Mobiles and call charges are forborne for WLL(M). The Interconnection Usage Charges Regulation, dated 24th January 2003, has specified the same termination charges between calls terminating in WLL (M) and CMSPs, except for long distance calls. With the establishment of the USO Fund, both Basic as well as Cellular Mobile Service Providers has the possibility to carry out Universal Service and claim reimbursement from the USO Fund in respect of the obligations carried out.

2.5 Although there exists parity on most issues, there are a number of issues such as difference in entry fees paid by the two types of licensees, and differences in their license roll out obligations and entitlement of spectrum in access network that require to be addressed.

2.5.1 Removing the concept of limited mobility:

With unified licensing basic service operators would also be permitted to offer cellular mobile services. The CMSPs would also be permitted to offer basic service without any technological restriction. However, it does not mean that a company holding license is permitted to directly interconnect across the service areas. This shall remain the exclusive right of the NLDO license in line with the prevailing licensing regime.



## 2.5.2 Entry Fee:

2.5.2.1 Annexure-II shows the entry fees paid by different service providers. Three different categories of entry fees may be considered. One, for the first the first six Basic Service Operators and the initial forty-two private CMSPs. The entry fees paid by them before migration to revenue sharing arrangement, w.e.f. 1.8.1999 has been separately indicated. Second, for other basic service providers, the entry fees paid as per DOT's guidelines have been indicated. For other CMSPs (4<sup>th</sup> Cellular Operator), the entry fee as decided through a multi-layer bidding process has been indicated. In order to a level playing field introduce a unified licensing regime, we need to take account of the various differences in the terms and conditions among basic and cellular license agreements.

2.5.2.2 In this context, a relevant factor is that the licensing process for 4<sup>th</sup> Cellular Operator was completed after the limited mobility was allowed to Basic Service Operators. It is, therefore, pertinent to note here that 4<sup>th</sup> cellular operators participated in the bidding process knowing fully well that basic service operators have been allowed to offer limited mobility service. Also, while the entry fee paid by CMSPs is higher, the BSOs have more stringent roll out obligations. However, the extent to which these roll out obligations have been met is also a point of consideration. Another important aspect to be kept in mind is the large difference in the growth rate for cellular and basic services, which would play a role in spreading the cost of entry fee over the operations of these service providers over time.

2.5.2.3 Another view could be that, even if there is a disparity in the entry terms and conditions, the existing operators have been in operation for almost seven to eight years, which gives them a first mover advantage over new service providers. In general the license fee paid by the fourth cellular operator is much less than that paid by the earlier cellular operators. This may lead to the argument that the operators have already created a niche market for themselves and for that they had paid a premium by way of a higher license fee when compared to a newcomer.

2.5.2.4 Based on the above, the issue for consideration could be whether basic service operators under unified licensing regime should pay higher entry fee.

### 2.5.3 Service Areas:

The service areas for Basic and Cellular Mobile Service differs to some extent. In the case of Basic Services, three metros, i.e., Mumbai, Kolkata and Chennai are respectively part of Maharashtra, West Bengal and Tamil Nadu circles, but these Metros have been licensed as separate service areas for cellular mobile services for historical reasons. Cellular mobile services in Metros were the first areas to be opened for private service sector. Under the unified licensing framework, the differences in the definition of service areas of basic and cellular services would have to be removed. The following options could be considered:-

- a) The service areas of these three metros are merged with service areas of respective circles, like for basic services.
- b) For basic services also the bifurcation is done as for cellular services, i.e., Mumbai, Chennai and Kolkata be made separate circles.
- c) Maintain the status quo for service areas.

### 2.5.4 Network Layout:

The Network layout/hierarchy is different for cellular mobile and basic services. The concept of local call does not exist in cellular and the level of handover of calls to another networks is also different. This leads to different types of tariffs/charges being applicable to their intra-circle calls.

### 2.5.5 Roll out Obligations:

BSOs have different roll out Obligations when compared with CMSPs, both in terms of roll out as well as Performance Bank Guarantee. While a BSO in a Service Area is required to provide POPs in all SDCAs within 7 years and that too in an identified ratio of Urban, Semi-Urban and Rural SDCAs, the roll out obligation of CMSPs is to cover 10% of DHQs in the first year and 50% of Districts head quarters in first three years. CMSPs are allowed to cover any town in lieu of DHQ in that District. In the Unified-licensing regime, we will need to address how these obligations should be incorporated? Should the roll out obligation be also imposed on CMSPs? Should the existing roll out obligation be carried over to the new licensing regime.

### 2.5.6 Performance Bank Guarantee:

Performance bank guarantee for basic service operators is 4 times the entry fee paid by service providers and is linked to roll-out obligations spread over 7 years period. For basic service operators the minimum Performance Bank Guarantee (PBG) is Rs.4 crore for the A&N circle and goes up to Rs.460 crores in Maharashtra circle. For CMSPs the performance bank guarantee is Rs.20 crore, Rs.10 crore and Rs.2 crore for category 'A', 'B' and 'C' circles (Please see Annexure III for details). This issue of significantly high differential in PBG amount and its validity period needs to be addressed while framing the terms and conditions of unified license.

### 2.5.7 Spectrum Policy:

In CDMA, spectrum available is 1.25 MHz. Spectrum charges are 2% of AGR for upto 5+5 MHz spectrum for WLL Services and upto 4.4 + 4.4 MHz for cellular services. For cellular services additional 1% of AGR is charged for spectrum beyond 4.4 + 4.4 MHz and upto 6.2 + 6.2 MHz spectrum and 1% more is charged upto 10 + 10 MHz. Under Unified licence regime the spectrum allocation and charging for spectrum will be another matter to address in the context of unified licensing.

#### 2.5.7.1 Issue of Spectrum Allocation

Presently, BSOs and CMSPs have been allocated spectrum based on their requirements. These allocations vary from one operator to the other. While in case of CMSPs, policy has been specified for allocation upto 10 +10 Mhz, in case of BSOs the license stipulates provisioning of spectrum only upto 5+5 MHz.

One important issue is whether to allow the existing operators to carry their spectrum to the new regime and what would be the new terms and conditions? In Malaysia and Singapore, at the time of migration, the existing operators were permitted to retain their allocated spectrum. If the unified licensing regime were made technology neutral, then how would the future spectrum allocations be carried out? Some of the spectrum that is used for CDMA today may also be used for GSM Services in the extended GSM band. In a converged scenario, should the operators be permitted to use the technology of their choice. What should be the basis for allocation of new spectrum? Should it be

through an open competitive mechanism such as auction or on a first cum first serve basis. In the European Union, the present policy for allocating spectrum e.g. 3G, is through an auction. In Australia as well as Singapore, auction has been used even for 2G spectrums. In Malaysia, however, a beauty contest is used for the purpose. In the event that the spectrum originally allocated for one type of technology users (such as CDMA) is allocated to the other then we need to address the issue of spectrum allocation for those operators who at the time of migration would not have got the maximum permissible amount of spectrum reserved for that license.

#### 2.5.8 Level of competition:

Basic Services have open competition while there is a restriction on the number of cellular operators due to availability of Spectrum. Under Unified Licensing regime both the service providers may offer wireline as well as wireless services, and the issue to be considered would be whether the opening of this service sector for further competition is necessary or the number of existing service providers (fixed and cellular both combined together) is sufficient to achieve the required level of competition. It is expected that after introduction of unified licensing regime, consolidation among service providers may take place. The viability of existing service providers, growth of telecom services, conditions of merger and acquisitions, benefits of competition to the consumers are some of the factors which may be considered while deciding this issue. The subject of merger and acquisition has been dealt in more detail in Chapter –4.

#### 2.5.9 Interconnection with other service providers:

Basic and Cellular operators have different network configurations and the level of inter-connection between basic and cellular, and basic and fixedbasic service providers is also different. The termination charges as prescribed in IUC Regulation, 2003 are also different for different type of services. In the Unified Licensing regime this differential in interconnect terms & conditions will have to be addressed because such distinctions may not be sustainable or desirable under unified licensing. Due to the difference in level of interconnection for an intra circle call from fixed to cellular subscriber, an issue of traffic bypass has been raised by BSOs. This too would need

addressing while prescribing interconnection terms and conditions among various service providers under Unified Licensing Regime. There would also be a need to clarify, which service operator is the interconnection provider and which is the interconnection seeker.

#### 2.5.10 Selection of NLD operator by the Subscriber:

Another important differential is that for basic service intra circle calls, wherein the subscriber may select another BSO as NLD operator. The same flexibility has not been defined in the existing CMSPs licence agreement. This issue needs to be addressed under the Unified Licence Regime.

#### 2.5.11 Validity of Licence period:

Both basic and cellular service license agreements have validity period of 20 years, extendable by 10 years. In a unified licensing regime, we would need to consider the validity period of the unified license agreement and its starting point.

#### 2.5.12 Numbering Plan:

If for all services, “Calling Party Pays” regime is applicable and there is a single licence for all services, then is it necessary to retain the existing numbering plan that distinguishes different type of subscribers or should we remove this distinction of number scheme among different type of subscribers, viz. Fixed, cellular and WLL (M). Numbering plan for basic is SDCA based and for CMTS is circle based. This distinction may have to go under a unified license notwithstanding that Government of India has recently issued the revised numbering plan.

#### 2.5.13 Different Mobile technologies:

The existing basic service providers are using CDMA technology for offering WLL including limited mobility services. Though CMSPs are allowed to use any digital technology, they are using GSM technology. Under the Unified License various types

of technologies would be used for offering cellular mobile services. Compatibility of these technologies may be an additional issue to consider.

## Chapter 3

### **International Practises on Unified licenses for wireline and wireless services including Cellular Mobile Services**

3.1 A number of countries are migrating towards the concept of unified / converged licensing for wireline and wireless services. This has been encouraged due to technological developments, consumer demands, long term sustainability of telecom service providers, and optimum utilisation of resources. The scenario of converged licenses in some countries from Asia-Pacific and Europe is discussed below. Many of these markets have high mobile and wireline penetration rates, and converged services are being driven by a very competitive marketplace.

#### **3.2 Malaysia**

In Malaysia, the licensing framework is formulated to be both technology and service neutral. The framework permits that communications infrastructure can be used to provide any type of communications service that it is technically capable of providing. Recognizing the fact that the legislation governing the communications industry was outdated and no longer representative of the merging market realities, the Government of Malaysia enacted a new convergence legislation, which comprises the Communications and Multimedia Act, 1998 (**CMA**) and the Malaysian Communications and Multimedia Commission Act 1998 (**MCMCA**). The introduction of CMA and MCMCA goes beyond the issue of unified licensing but in this paper this issue has been considered only to the extent of addressing unified licensing of fixed and mobile services. So far as unified licensing for wireline and wireless services in Malaysia is concerned, there are four categories of licenses viz. Network Facilities Providers, Network Service Providers, Application Service Providers and Content Application Service Providers. The details of which are as follows:

3.2.1 **Network Facilities Providers (NFP)** - are the owners of facilities such as satellite earth stations, broadband fibre optic cables, telecommunications lines and exchanges, radiocommunications transmission equipment, mobile communications

base stations, and broadcasting transmission towers and equipment. They are the fundamental building block of the convergence model upon which network, applications and content services are provided.

**3.2.2 Network Services Providers (NSP)** - provide the basic connectivity and bandwidth to support a variety of applications. Network services enable connectivity or transport between different networks. A network service provider is typically also the owner of the network facilities. However, a connectivity service may be provided by a person using network facilities owned by another.

**3.2.3 Applications Service Providers (ASP)** - provide particular functions such as voice services, data services, content-based services, electronic commerce and other transmission services. Applications services are essentially the functions or capabilities, which are delivered to end-users.

**3.2.4 Content Applications Service Providers (CASP)** - are special subset of applications service providers including traditional broadcast services and newer services such as online publishing and information services.

Further, there are Individual, Class and Exempt categories depending upon the type of activity / importance of the individual activity. Malaysia does not have any distinction between mobile or fixed, as the licensing regime is technology neutral. In order to provide these services, there is a need to obtain three licenses ( NFP, NSP and ASP). However there are providers such as MVNOs ( Mobile Virtual Network Operators) who can have ASP license and can provide mobile services by using the network and services of existing NSP/ NFP licensees.

### **3.2.5 License Fee :**

The applicable license fees for each type of licence are as follows:

- a) Application Fee - RM10,000.00 (non refundable)
- b) Approval Fee - RM50,000.00
- c) Annual Fee - 0.5% of Gross Annual Turnover or RM50,000 - whichever is higher



There are rebate clauses in License Fee for R&D and other activities.

### **3.3 Australia**

Upto 1997, three operators (Telstra, Optus and Vodafone) were offering mobile services on GSM networks. The Telecommunications Act 1997 opened the Australian market to further competition, placing no limits on the number of general carrier licences. In 1998, the 800MHz and 1800MHz spectrums were auctioned. General competition laws in Australia prevent a company from using the position in a market in which it has a substantial degree of power to gain an advantage in a more competitive market. In Australia, there is an open licensing regime for telecommunications with no distinction being drawn on the basis of the technology used. The Regulatory framework encourages Fixed-mobile convergence. Licenses are general telecoms licenses. There is no distinction between fixed and mobile services. The incumbent operator is not required to provide separate accounting for fixed and mobile services. The Australian Communications Authority (ACA) administers the regime that licenses telecommunications carriers. A carrier license allows the owner(s) of a network to supply carriage services to the public subject to obligations set out in its license, the Telecommunications Act 1997, and any additional conditions imposed by the Minister. Carriers are individually licensed and pay application and ongoing licence fees that recover the costs of regulating the industry. There is an application charge of \$ 10,000 which is payable before the application can be processed. Carriers are required to pay an annual license charge. This comprises a \$ 10,000 fixed component and a variable component based on carrier's eligible revenue. Service providers are not subjected to any licensing requirements but are required to comply with a range of obligations including the standard service provider rules set out in Schedule 2 of the Telecommunications Act. One.Tel was the first Australian telephone company to offer users the opportunity to merge mobile, long-distance, fax and Internet services on one bill. Instead of having to make multiple payments every month or quarter, only one payment per month is required. Most new entrants into the telecommunications market can now offer a full range of fixed and mobile services. Some of these companies act as resellers of mobile network capacity for one of the three mobile operators. Generally all mobile operators offer mobile VPN services.

### 3.4 Singapore

In Singapore, a Unified-licensing framework has already been implemented. The basic intention of the framework is to have a single license for all networks / services the operator intends to operate / offer. The licensees have been categorised into Facilities based Operators (FBOs) and Service Based Operators (SBOs).

The Facility based operators (FBOs) can build telecommunications network for the carriage of telecommunications and broadcast traffic. The guidelines<sup>1</sup> state

*“The range of telecommunication services to be provided over the licensees’ facilities can include backbone/wholesale bandwidth capacity and interconnection/access services to other licensed telecommunication operators, or other domestic and international services such as the following.*

- *Public Switched Telephone Services*
- *Public Switched Message Services*
- *Public Switched Integrated Services Digital Network (ISDN) Services*
- *Leased Circuit Services*
- *Public Switched Data Services*
- *Public Radio-communication Services*
- *Public Cellular Mobile Telephone Service (PCMTS)*
- *Public Radio Paging Services (PRPS)*
- *Public Trunked Radio Services (PTRS)*
- *Public Mobile Data Services (PMDS)*
- *Public Mobile Broadband Multimedia Services*
- *Public Fixed-Wireless Broadband Multimedia Services*
- *Terrestrial Telecommunication Network for Broadcasting Purposes*
- *Satellite Uplink/Downlink for Broadcasting Purposes”*

The entry fees and the license fees depends upon the service to be provided and is generally expressed as a percentage of Annual Gross Turnover (AGTO) subject to a (Footnotes)

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<sup>1</sup> Available at [http:// www.ida.gov.sg](http://www.ida.gov.sg)

minimum in some cases. Table 3.1 provides the details of entry fees, license fees and duration of license for each service.

Table 3.1: Entry fees, Annual fees and license duration in Singapore

Licence	Licence Fee
<ul style="list-style-type: none"> <li>FBO designated as PTL</li> </ul>	Initial Fee: None Annual Fee: 1% AGTO, subject to a minimum of S\$250,000 per year Licence Duration: 20 years, renewable for a further period as IDA thinks fit
<ul style="list-style-type: none"> <li>Terrestrial telecommunication networks for telecommunication purposes</li> </ul>	Initial Fee: None Annual Fee: 1% AGTO, subject to minimum of S\$100,000 per year Licence Duration: 15 years, renewable for a further period as IDA thinks fit
<ul style="list-style-type: none"> <li>Public cellular mobile telephone services</li> <li>Public mobile broadband multimedia services</li> <li>Public fixed-wireless broadband multimedia services</li> </ul>	Due to limited frequency spectrum, the licence fees and licence duration will be specified together with the approach to award the respective spectrum rights and licences, via a comparative selection exercise and/or an auction exercise.
<ul style="list-style-type: none"> <li>Public radio paging services</li> <li>Public mobile data services</li> <li>Public trunked radio services</li> </ul>	Initial Fee: None Annual Fee: 1% AGTO, subject to minimum of S\$1,200 per year Licence Duration: 10 years, renewable for a further period as IDA thinks fit
<ul style="list-style-type: none"> <li>Terrestrial telecommunication network for broadcasting purposes only</li> <li>Satellite Uplink/Downlink for broadcasting purposes</li> </ul>	Initial Fee: None Annual Fee: S\$5,000 Licence Duration: 10 years, renewable on a 5-yearly basis

Source: <http://www.ida.gov.sg>, FBO guidelines

However, in addition to these there are other charges such as spectrum, Number Allocation Charges, etc.

### **3.5 European Union**

#### **Single Regulatory framework as a result of EU Directive**

The European Parliament and the Council gave a set of five directives to its Member States so as to provide for a single Regulatory framework for all transmission network and services.

These directives are

- a) Directive 2002 / 21 / EC which provides a common regulatory framework for electronic communications network and services;
- b) Directive 2002/20/EC on the authorization of electronic communications network and services
- c) Directive 2002/19/EC on access to, and interconnection of, electronic communications network and associated facilities;
- d) Directive 2002/22/EC on universal service and user's rights relating to electronic communications network and services
- e) Directive 97/66/EC on the processing of personal data and the protection of privacy in the telecommunications sector

3.5.1 The Authorization directive recognizes that

“(2) Convergence between different electronic communications networks and services and their technologies requires the establishment of an authorization system covering all comparable services in a similar way regardless of the technologies used.”

The directive requires

“2. The provision of electronic communications networks or the provision of electronic communications services may, without prejudice to the specific obligations referred to in Article 6(2) or rights of use referred to in Article 5, only be subject to a general authorization. The undertaking concerned may be required to submit a notification but may not be required to obtain an explicit decision or any other administrative act by the national regulatory authority before exercising the rights stemming from the authorization. Upon notification, when required, an undertaking may begin activity, where necessary subject to the provisions on rights of use in Articles 5,6 and 7.”

3.5.2 The Service specific licenses will be replaced by authorizations in the EU Countries. The Member States are however, permitted to impose a set of conditions to the general authorizations, for example financial contributions to funding Universal Service, Administrative charges to cover costs which will be incurred in the management, control and enforcement of the general authorisation scheme and of rights of use and of specific obligations as referred to in Article 6(2), (which may include costs for international cooperation, harmonisation and standardisation, market

analysis, monitoring compliance and other market control, as well as regulatory work involving preparation and enforcement, of secondary legislation and administrative decisions, such as decisions on access and interconnection) accessibility of numbers, interoperability of services etc.

3.5.3 For the use of Radio Spectrum, grant of numbers and rights to install facilities the relevant authorities may impose separate fees. Specifically, in case of spectrum Member States can grant such rights on the basis of selection criteria, which must be objective, transparent, non – discriminatory and proportionate. In Denmark, Executive Order No. 786 of 19<sup>th</sup> September 2002 does not require a service provider to obtain a licence. He need not take any action or await a decision from the National IT- and Telecom Agency before launching the service, and no specific payment on the part of the service provider is required. Interconnection to other networks is subject to the telecommunications regulation on competition and interconnection. A separate authorisation for frequencies is, however, required. Details for selected European countries are given below.

### **3.6 Finland**

3.6.1 There are more than 90 telecommunications service providers in Finland including local, long distance, international and mobile operators. The annual telecommunications turnover is about FIM 16,000 million (about USD 2,800 million). As a result of continuous telecommunication liberalization new licensing procedure was adopted as of June 1 1997. A license is now mandatory only if an operator provides mobile telecommunications service, which requires frequencies, i.e. effectively a unified license is available if frequency spectrum is obtained.

3.6.2 Before 1994, local and long distance services in Finland were provided by different companies. Forty-five locally based operators (later known as Finnet Group) provided local services. Telecom Finland ( now called Sonera) was the traditional monopoly long-distance and international operator. It also provided local services in remote areas of the country. The Finnish market was fully liberalised at the end of 1994, enabling the Finnet Group and Sonera to compete in each other's markets. In the mobile market Sonera, Radiolinja, Finnet group and Telia Finland were the key players. Sonera and Radiolinja have GSM and DCS1800 licenses. Telia Finland

and Finnet group have DCS1800 licenses. Sonera used its DCS capacity to enhance the GSM market and to offer homezone service. Telia also offered a homezone tariff on its GSM 1800 network at a level that put it into competition with fixed line services. In terms of convergent services, no other market in the world is as advanced. Finland was one of the first countries where convergent services became available. The first DECT-based public access service and the first mobile centrex solutions were introduced in Finland, and a mobile VPN service was launched in 1991. In the beginning of 1999, almost 60% of the population had a mobile phone. This rate was higher than the wireline penetration rate in Finland.

3.6.3 Helsinki Telephone Company, the largest local telephone company within Finnet group, had launched a unique flat-rate low mobility DCS1800 service, called Cityphone. This was integrated within the PSTN numbering plan and offers single billing and a single voicemail box. Calls to fixed line number are automatically diverted when the fixed phone is not answered. Calls between the fixed number and related mobile numbers are also cheaper than standard PSTN rates.

### **3.7            Germany**

Germany has been slow to liberalise its telecoms markets. Mobile competition was first introduced in 1992 and fixed markets were fully deregulated in 1998. The Regulatory Authority for Telecommunications and Posts (RegTP), was established in January 1998. It has been a strong and effective body in maintaining fair competition. RegTP encourages convergent services, and most of the German mobile operators have fixed licensee as a shareholder and they can provide integrated fixed and mobile services. Unified licensing has been actively promoted in Germany by the service providers. Viag Interkom, one of the key players in Germany, is using an integrated network to offer fixed and mobile services. Most converged services in Germany are based on mobile VPN services and on personal numbering. Mobile tariffs have tended to be high in Germany, but price wars have competition has led to tariff reductions and several initiatives in new pricing structures, including homezone tariffing. German operators are already on course to offer a wide range of fixed and mobile convergent services viz. personal numbering and homezone services.

### **3.8 U.K.**

In U.K, OFCOM the new telecom and broadcasting regulator has been set up and the communication bill is likely to be passed by British Parliament by the end of this year. The draft communication bill abolishes the requirement for licensing the new framework in the draft bill is consistent with the EU directive concept, which states that persons wishing to provide electronic networks and services should be free to do so without having to obtain prior permission, subject only to giving notification to the regulatory Authority and subject to compliance with applicable obligations.

### **3.9 Summary**

A growing International trend is either to abolish the requirement for licensing or to consider the possibility of convergence. In fact, countries like Denmark have already abolished the licensing regime. Ultimately, a situation will come where the concept of service wise license will not be relevant. For example, Directive 2002/21/EC of the European Parliament and of the Council of March 7, 2002, the convergence of the Telecommunications, Media and Information Technology sectors means that all transmission networks and services would be covered by a single regulatory framework.

## Chapter 4

### Consolidation in the Indian Telecom Services Sector

4.1 The Indian Telecom Sector has seen substantial some consolidation through Mergers & Acquisitions, especially in the Indian Cellular Industry. The License also mentions that TRAI should be consulted in matters of M&A by the licensor

4.2 The present licensing framework defines separate market for basic and cellular services and at a broad level, the policy permits acquisitions subject to competitive safeguards mentioned in the Basic and Cellular Licenses, such as:

4.2.1 No single company/legal person, either directly or through its associates, shall have substantial equity holding in more than one Licensee Company in the same service area for the same service. 'Substantial equity' herein will mean 'an equity of 10% or more'. A promoter company cannot have stakes in more than one licensee company for the same service area

4.2.2 Management control of the licensee company shall remain in Indian Hands transfer of equity inter-se between existing Indian promoters may be permitted, provided the majority Indian promoter continues to hold at least the present shareholding for a period of five years from the EFFECTIVE DATE of LICENCE AGREEMENT.

4.2.3 The merger of Indian companies may be permitted as long as competition is not compromised

4.3 Further, De-merger has been permitted by a recent amendment dated 2/6/2003 of the Clause 'Transfer of License' in the respective licenses, which allows a company operating in a number of circles, to separate out their operation in one of thea single circle, and then this separate company can be acquired without affecting the other circles where the pre-acquired (parent) company had has its operations.



4.4 Under the unified licensing regime, with the emergence of a single entity for basic and mobile service providers, the definition of the market will get widened to include both these services. Also, in the unified licensing regime based on present Licensees, there could be up to 7-8 service providers offering both Basic and Mobile Services in any service area; the number could be higher given that basic service has open competition without any restriction on the number of operators. The detailed guidelines for Merger and Acquisition would have to be prepared for examining the Merger and Acquisition proposals under unified licensing regime.

4.5 Under these circumstances, there might be market requirements for Mergers & Acquisitions amongst the licensees in the same Service Area providing the same service so as to increase the efficiency of Service Providers and improve their financial viability. Internationally, the number of mobile operators are around 3 to 4 in a service area barring a few exceptions such as Hong Kong (6 operators). International practices in this regard are given in Annexure IV. The numbers of licensees in the Indian scenario are mentioned in Annexure V.

4.6 Drawing from international practices, one would comment that consolidation amongst the existing operators through horizontal mergers would be likely in a unified license context. Such Horizontal Mergers in the same service area, which are not permitted till date may perhaps be required for the sustainability of the telecom sector. However, a closer look and much tighter controls will need to be observed so as to ensure that competition is not adversely affected.

4.7 Merger can yield significant benefits such as economies of scale or scope and would also provide easy exit policy to inefficient players. There could also be cases that two inefficient competitors may become one effective competitor.

#### 4.8 Guidelines

4.8.1 Many regulators / Competition Authorities have come up with a set of guidelines for permitting Mergers. The various steps taken by the Competition Authorities in the USA while considering Mergers are as under:-

- 4.8.1.1 Defining the market
- 4.8.1.2 Identifying market participants
- 4.8.1.3 Determining market concentration
  - o Herfindahl-Hirschman Index (HHI), which provides a yardstick of market concentration
- 4.8.1.4 Determining the likelihood of coordination
  - o (Cartel formation, ability to deter growth of other entities)
- 4.8.1.5 Conducting a market entry analysis
- 4.8.1.6 Analyzing internal efficiencies

4.8.2 A need for similar regime / conditions would be relevant also for India. One benchmark for analysing the necessity of Mergers is that the efficiencies resulting from the merger should not be available through just interconnection

4.9 It is very important in this context to clarify that the TRAI shall continue to take the necessary steps that would ensure level playing field amongst licensees and across licenses.

#### 4.10 Availability of Spectrum:

4.10.1 Individually, most of the cellular operators are facing the constraints of available spectrum. The international practice on the amount of spectrum generally available with the Cellular operators is mentioned in Annexure VI. The cost of rolling out the network and meeting the QOS Standards is a function of available Spectrum also. Efficient utilization of Spectrum is a must for growth of telecom services.

4.10.2 With the merger of service providers in the same service area, the spectrum available with merged entity may accommodate larger number of subscribers as more efficient planning could be carried out.

4.10.3 An important issue for consideration is whether the Spectrum available with individual entities would also be merged, or should the government examine the frequency requirements at the time of takeover.

#### 4.11 International Practices on mergers and acquisitions :

4.11.1 Internationally, the Regulators and Competition Authorities evaluate consolidation in the industry with a viewpoint that it should not result in 'Substantial lessening of competition'. Practices from some of the countries are mentioned below:

##### 4.11.2 South Korea:

Following the economic crisis in 1997 the Korean mobile industry underwent a period of consolidation with five mobile operators merging into three within a three-year period.

"In December 1999, the largest market operator, SK Telecom, initiated a merger with Shinsegi Telecom by acquiring a controlling share of stakes in Shinsegi Telecom. This proposal was approved in April 2000 by the KFTC, subject to the condition that the total market share of the merger entity be reduced to below 50 per cent by June 2001 and the volume of mobile handsets SK Telecom would be allowed to procure from its subsidiary was limited to 1.2 million sets over a period of five years (2000-2005). At the end of June 2001, SK Telecom (Shinsegi Telecom included) satisfied the KFTC's conditions by reducing its share of subscribers—partly accomplishing this by not engaging in active marketing in what is a fast-growing market—to 49.7 per cent at the end of June 2001, enabling its merger and acquisition (M&A) with Shinsegi Telecom. On 14 January 2002, the Ministry of Information and Communication gave its final approval of the merger with 13 attached conditions including the opening of the company's wireless Internet network to competitors, and equal network access rights to content providers and ISPs (Internet service providers).

##### 4.11.3 United States of America

4.11.3.1 In USA, Mergers are generally overlooked by three entities, Department of Justice (DoJ), Federal Communications Commission (FCC) and Federal Trade Commission (FTC). In USA, while examining Mergers, FCC also examines the balance

of other potential benefits or harms. In a unilateral effects context, marginal cost reductions may reduce the merged firm's incentive to elevate price. Efficiencies also may result in benefits in the form of new or improved products, and efficiencies may result in benefits even when price is not immediately and directly affected.

The merging firms must substantiate efficiency claims so that the Agency can verify by reasonable means the likelihood and magnitude of each asserted efficiency, how and when each would be achieved (and any costs of doing so), how each would enhance the merged firm's ability and incentive to compete, and why each would be merger-specific. The Agency considers whether cognizable efficiencies likely would be sufficient to reverse the merger's potential to harm consumers in the relevant market, e.g., by preventing price increases in that market. Only mergers that would be likely to have the effect of substantially harming or reducing competition should be prohibited. The steps that are taken by FCC and Competition Authorities are already mentioned earlier. A yardstick for measurement of market concentration used in FCC is Herfindahl-Hirschman Index (HHI).

### Test for market concentration: **The HHI: A Gauge of Market Concentration**

The Herfindahl-Hirschman Index (HHI) for any market is the sum of the squares of all the companies' market shares. If the HHI of a market is less than 1,000, the market is considered "unconcentrated." If the HHI is between 1,000 and 1,800, the market is held to be "moderately" concentrated. Any HHI above 1,800 is thought to denote a highly concentrated market.

- **Market HHIs below 1,000.** If the proposed merger would result in an HHI below 1,000, the Department would perceive the market as still unconcentrated and likely would **not analyze the merger further.**
- **Market HHIs between 1,000 and 1,800.** Where the post-merger HHI would be between 1,000 and 1,800, **any merger that increased concentration by less than 100 HHI points would still be considered as having minimal impact** and would not be analyzed further.
- **Market HHIs above 1,800.** Similarly, in highly concentrated markets (those above 1,800 HHI) any merger that **would increase the already high HHI by 50 points or more would lead to further merger review.**
- **Source: Competition Policy in Telecommunications, ITU**

4.11.3.2 As per the US guidelines, A merger is not likely to create or enhance market power if the following circumstances are met:

- a) the allegedly failing firm would be unable to meet its financial obligations in the near future;
- b) it would not be able to reorganize successfully under Chapter 11 of the Bankruptcy Act;
- c) it has made unsuccessful good-faith efforts to elicit reasonable alternative offers of acquisition of the assets of the failing firm that would both keep its tangible and intangible assets in the relevant market and pose a less severe danger to competition than does the proposed merger; and
- d) absent the acquisition, the assets of the failing firm would exit the relevant market.

#### **4.11.4 Australia**

4.11.4.1 In Australia, Mergers & Acquisitions are covered under Trade Practices Act 1974. While it is not compulsory for the companies to inform ACCC before Mergers, Mergers if carried out without seeking opinion of ACCC once found to be in contravention of the Trade Practices Act 1974 is subject to penalty. The role of ACCC is to advise the companies on their compliance with the Section 50 and 50 (1) of the Act, and in event of non-compliance stop the Merger, by asking the parties failing which by approaching the court. The following are recognized as the possible anti-competitive effects of Mergers

- a) Horizontal acquisitions may reduce competitive zeal between rivals, e.g BSO to BSO;
- b) Acquisitions in one market by parties, which are rivals in another market, may facilitate coordinated conduct in second or third market;
- c) Vertical acquisitions may result in foreclosure of rival suppliers;
- d) Horizontal and vertical acquisitions may provide access to commercially sensitive information in relation to competitors; (e.g. holdings in vendors)
- e) Horizontal and vertical acquisitions may block potentially pro-competitive mergers and acquisitions

4.11.4.2 Competition concerns are unlikely to arise, where

- a) Unless the parties compete in the same market or vertically related markets, competition concerns are unlikely to arise;
- b) If combined market share of the companies is small or if there is strong import competition or low entry barriers,

4.11.4.3 ACCC also assesses

- a) What is the relevant market?
- b) Is the market substantial;
- c) Will the acquisition be likely to substantially lessen competition?

4.11.4.4 The following merger factors are analysed by the ACCC in Australia:

- (a) Actual and potential level of import competition in the market;
- (b) Heights of Barrier to entry;
- (c) Level of concentration in the market;
- (d) Degree of countervailing power in the market;
- (e) Likelihood that the acquisition would result in the acquirer being able to significantly and substantially increase prices or profit margins;
- (f) Extent to which substitutes are available or likely to be available;
- (g) Dynamic characteristics of the market including growth, innovation and product differentiation;
- (h) Likelihood that the acquisition would result in removal from the market of a vigorous and effective competitor;
- (i) Nature and extent of vertical integration in the market

# Chapter 4

## Issues For Consideration

- 5.1 Should there be a unified license for basic and cellular mobile service in India?
- 5.2 If a unified license is to be implemented, what changes in the license terms and conditions should be made to bring about such a license, both in terms of entry conditions as well as other conditions during the term of the License?
- 5.3 How should consistency be achieved within a regime of unified License for basic and cellular mobile regarding the differences in:
- a) definition of service areas;
  - b) roll out obligations;
  - c) performance bank guarantees;
  - d) spectrum availability and charges;
  - e) interconnection between services,
  - f) call carriage/charging;
  - g) termination charge regime applicable to different types of calls;
  - h) definition of interconnection seeker/provider;
  - i) numbering;
  - j) mobile technologies used
  - j) any other.
- 5.4 What is the implication of a unified licensing regime for sustainability of the market?
- 5.5 Unified License may imply a need to facilitate mergers and acquisitions. What conditions should apply for this purpose in respect of:
- a) spectrum available with the merged entities
  - b) definition of “market” in order to determine whether a merged entity has significant market presence;
  - c) conditions that should be specified to ensure that competition is not compromised.
- 5.6 Should the regulator evolve some specific principles with respect to the number of operators that are desirable to be present in the market;

5.7 What should be the validity period and the effective date of the unified License.



## Annexure I: Comparison of BSO and CMSO license

	BSOs	CMSOs
Service Area	Circles and Delhi	The country is divided into 23 Service Areas comprising of 19 Telecom Circle Service Areas and 4 Metro City Service Areas for grant of licenses for Cellular Mobile Telephone Service (CMTS).
Mobility and V 5.2 interface	<p>The LICENSEE is allowed to provide mobility to its subscribers with Wireless Access Systems but limited to the local area i.e. Short Distance Charging Area (SDCA) in which the subscriber is registered</p> <p>Further such system shall be engineered to be connected to Telephone Exchange of Short Distance Charging Area (SDCA) on Access Network protocol based on National Standards for V5.2 as prescribed by Telecom Engineering Centre or an approved improved version with latest technology.</p> <p>Service covers collection, carriage, transmission and delivery of voice and non-voice MESSAGES by use of any type of network equipment including circuit and/or packet switching.</p>	The licensee shall be permitted to provide, in its area of operation, all types of mobile services including voice and non-voice messages, data services and PCOs utilizing any type of network equipment (however, the technology must be digital), including circuit and/or packet switches, that meet the relevant International Telecommunication Union (ITU)/Telecommunication Engineering Center (TEC) standards. Provided that a pilot project may also be approved and licensed for any period by the Licensor for inducting a new Technology.
Intra Circle equal access	The subscriber of the intra-circle long distance calls, shall be given the choice to use the network of another Basic Service Provider in the same service area. The LICENSEE can also make mutual agreements with National Long Distance Operators for carrying intra Circle Long Distance traffic	No such provision in CMSPs license.
Interconnection with other networks	LICENSEE shall interconnect with Cellular Mobile Telephone SERVICE PROVIDER at the station of Gateway Mobile Switching Centre (GMSC) or Mobile Switching Centre (MSC), unless mutually agreed otherwise	Point of Inter-connection (POI) between the networks of cellular mobile Telephone service providers and fixed service providers shall be only with Level-I TAXs and Tandem exchanges in the Metros. In Telecom Circles the interconnection shall be with level I TAX/interconnection with level II TAXs may also be allowed, however, transiting of traffic to other LDCAs at POIs on level II TAX is not permitted

**ii) Entry Fee**

	<b>BSOs</b>	<b>CMSOs</b>
Entry fees	Depends on Service Area. Entry Fee for Category 'A' circle varies from Rs. 35-115 Crores, for Category 'B' circle varies from Rs. 10-25 Crores and for Category 'C' circle varies from Rs. 1-10 Crores. Details given at Annexure II.	Through Bidding. Varies from 0.38 – 512 crores approximately. Details given at Annexure II.

**iii) License fees & Bank Guarantee**

	<b>BSOs</b>	<b>CMSOs</b>
<b>Spectrum charges</b>	An additional revenue share of 2% (Two per cent) of ADJUSTED GROSS REVENUE earned from Wireless Local Loop (WLL) subscribers shall be payable as spectrum charge for allocation of up to 5 plus 5 Mhz. This will include royalty for spectrum of 5+5 MHz as well as the LICENCE Fee for the base station and SUBSCRIBER terminal (handheld or fixed).	The cellular licensees are to pay spectrum charge in addition to the License Fee for CMTS with effect from 1.8.1999 on revenue share basis at the rate of 2% of Adjusted Gross Revenue (AGR) for spectrum upto 4.4 MHz + 4.4 MHz and 3% of AGR for spectrum upto 6.2 MHz + 6.2 MHz.  Further, for additional spectrum of 1.8 MHz + 1.8 MHz, if assigned for any one or more places in a service area, beyond 6.2 MHz + 6.2 MHz, an additional charge of 1% of AGR will be levied. Thus, the total spectrum charge to be paid by such operators would be 4% of AGR would also cover allocation of further spectrum, which may become possible to allocate in future subject to availability, to add up to a total spectrum allocation not exceeding 10 MHz + 10 MHz per operator in a Service Area. Such additional allocation could be considered only after a suitable subscriber base, as may be prescribed, is reached.

## Performance Bank Guarantee & Financial Bank Guarantee

	BSOs	CMSOs
<b>Performance Bank Guarantee</b>	<p>Performance bank guarantee equal to 20%, 30% and 50% of total BG linked with roll out after 3 yrs, 5 yrs and 7 yrs. The details are enclosed at Annexure III.</p> <p>PBG for Basic is 4 times of entry fees and varies from 4 crores (A&amp;N) to 460 crores (Maharashtra)</p> <p>PBG for Category 'A' varies from Rs. 140 - 460 Crores, for Category 'B' varies from Rs. 40 - 150 Crores and for Category 'C' it varies from Rs. 4 -20 Crores.</p>	<p>PBG of 20, 10 and 2 Crores for category A, B and C Service Areas respectively before signing of License. The licensee shall be permitted to reduce the value of the PBG by 50% after the coverage criteria prescribed in this license is fulfilled.</p>

### iv) Roll out obligations

#### iv. I) Roll out obligation of BSO

9.3 (a) The LICENSEE undertakes to fulfill the following minimum network roll out obligations:

Phase 1	Time period for completion from EFFECTIVE DATE of LICENCE AGREEMENT 2	Cumulative % of coverage in terms of Point of Presence to be achieved at SDCA level at the end of each phase 3	% of performance guarantee that can be released on fulfillment of obligations shown under column 3 4
I	2 Years	15%	--
II	3 Years	40%	20%
III	5 Years	80%	30%
IV	7 Years	100%	50%

1. However, coverage beyond 80% SDCAs in a SERVICE AREA may be done jointly with an other LICENSEE excluding BSNL/MTNL.
2. The roll out obligations specify the list of SDCAs category-wise in terms of (a) rural; (b) semi urban; & (c) urban, and LICENSEE has to fully ensure that each of the named categories is covered in equal proportion during each phase of the roll out obligations (Note: Number of SDCAs are approximately five times the number of DHQs i.e. 2647 SDCAs and 589 DHQs)

#### **iv. ii) Roll out obligation of CMSOs**

The Licensees shall endeavour to cover the entire Service Area at an early date and notify on quarterly basis the areas not covered by the licensee's system. In Metros, 90% of the service area shall be covered within one year of the effective date. In Telecom Circles, atleast 10% of the District Headquarters (DHQs) will be covered in the first year and 50% of the District Headquarters will be covered within three years of effective date of Licence. The licensee shall also be permitted to cover any other town in a District in lieu of the District Headquarters. Coverage of a DHQ/town would mean that at least 90% of the area bounded by the Municipal limits should get the required street as well as in-building coverage. The District Headquarters shall be taken as on the effective date of Licence. The choice of District Headquarters/towns to be covered and further expansion beyond 50% District Headquarters/towns shall lie with the Licensee depending on their business decision.

#### **Penalty**

In case the Licensee fails to bring the Service or any part thereof into commission (i.e., fails to deliver the service or to meet the required coverage criteria) within the period prescribed for the commissioning, the Licensor shall be entitled to recover Rs. 5 Lakh (Rupees: Five Lakhs) for each week of the delay or part thereof, subject to maximum Rs. 100 Lakhs (Rupees: One Hundred Lakhs). For delay of more than 20 weeks the Licence shall be terminated under the terms and conditions of the Licence agreement

**Annexure II: Entry fees for Basic and Cellular Mobile Service Providers (Page 1 of 2)**

CMSPs						BSOs				Difference in entry fees of CMSOs and BSOs	
S.No.	Circle (A)	Licensee (Old) (B)	From Licensees of Pre-Migration(Amt. in Crores) (C)	New Licensee (D)	From 4th Cellular Operators (Amt. in Crores) (E)	Name of the operator (F)	Entry fee from Licensees migrated (Amt. in Crores) (G)	Name of new operator (H)	Entry fee from new operators(Amt. in Crores) (I)	Difference in Entry Fee Paid at the time of migration (C-G)	Difference in license fees paid by the new entrants (E - G)
1	Rajasthan	ADIL	108.99	Escorts	32.25	Shyam Telelink	29.29			79.7	32.25
	Rajasthan	Hexacom	108.32								
2	UP(East)	ADIL	138.26	Escorts	45.25			Reliance Telecom	15		30.25
3	Gujarat	Birla AT & T	511.99	Bharti	109.01	Reliance Telecom	60.83	TTSL	40	451.16	69.01
		Fascel	508.82								
4	Maharashtra	Birla AT & T	473.07	Bharti	189	Hughes	105.54	Reliance Telecom(Inc. Mumbai)	115	456.39	74
		BPL	470.14								
5	North East	Reliance	1.21								
		Hexacom	1.21								
6	Karnataka	Spice	395.04	Barakamba	206.83			TTSL	35		171.83
		Bharti Mobile	375.7					Reliance Telecom	35		
								Bharti Telenet	35		
7	Punjab	Spice	359	Escorts	151.75	HFCL	18.55	Reliance Telecom	20	340.45	131.75
8	AP	Bharti Mobile	285.64	Barakamba	103.01	TTSL	16.85	Reliance Telecom	35	268.79	68.01
		Tata	283.87								
9	Haryana	ADIL	68.45	Bharti	21.46			Reliance Telecom	10		11.46
		Escotel	68.45					Bharti Telenet	10		
10	Kerala	Escotel	147.53	Bharti	40.54			Reliance Telecom	20		20.54

**Annexure II: Entry fees for Basic and Cellular Mobile Service Providers (Page 2 of 2)**

		BPL	147.53							
11	UP(West)	Escotel	115.9	Bharti	30.55			Reliance Telecom	15	15.55
12	West Bengal	Reliance	12.24					Reliance Telecom(Inc. Kolkata)	25	
13	MP	Reliance	14.56	Bharti	17.45	Bharti Telenet	6.48	Reliance Telecom	20	8.08 -2.55
		RPG	14.56							
14	Assam	Reliance	0.38							
15	Bihar	Reliance	89.49					Reliance Telecom	10	
16	Himachal	Reliance	4.27	Escorts	1.1			Reliance Telecom	2	-0.9
		Bharti Telenet	4.27							
17	Orissa	Reliance	58.48					Reliance Telecom	5	
18	Tamil Nadu	BPL	238.56	Bharti	79			TTSL(Inc. Chennai)	50	29
		Srinivas	44.35					Reliance Telecom(Inc. Chennai)	50	
								Bharti Telenet(Inc. Chennai)	50	
19	Delhi	Bharti	98.15	Birla At & T	170.7			TTSL	50	120.7
		Sterling	70.94					Reliance Telecom	50	
								Bharti Telenet	50	
20	Mumbai	BPL	88.86	Bharti	203.66	Hughes(Inc. MH)	105.54	Reliance Telecom (Inc. MH)	115	88.66
		Hutchison Max	83.33							
21	Chennai	RPG	21.59	Barakamba	154			TTSL(Inc. TN)	50	104
		Skycell	20.95					Reliance Telecom(Inc. TN)	50	
								Bharti Telenet(Inc. TN)	50	
22	Kolkata	Modi Tels	31.9	Reliance	78.01			Reliance Telecom(Inc. WB)	25	53.01
		Usha	25.8							
	<b>Total</b>		<b>5491.8</b>		<b>1633.57</b>		<b>343.08</b>		<b>1037</b>	<b>1604.57 1016.57</b>

**ANNEXURE-III ELIGIBILITY REQUIREMENTS AND LICENCE FEE**

Telecom Circles	Net worth requirement (Rs. Crores)	Paid-up Equity required (Rs. Crores)	Entry fee (Rs. Crores)	Performance Bank Guarantee (Rs. Crores)				% of revenue as Licence fee.
				20% BG1	30% BG2	50% BG3	100% 1+2+3	
<b>Category A Circles</b>								
Andhra Pradesh	1000	100	35	28	42	70	140	12%
Delhi	1000	100	50	40	60	100	200	12%
Gujarat	1000	100	40	32	48	80	160	12%
Karnataka	1000	100	35	28	42	70	140	12%
Maharashtra (including Mumbai & Goa)	1000	100	115	92	138	230	460	12%
Tamil Nadu (including Chennai)	1000	100	50	40	60	100	200	12%
<b>Category B Circles</b>								
Haryana	700	70	10	8	12	20	40	10%
Kerala	700	70	20	16	24	40	80	10%
Madhya Pradesh (including Chattisgarh)	1000	100	20	16	24	40	80	10%
Punjab	700	70	20	16	24	40	80	10%
Rajasthan	1000	100	20	16	24	40	80	10%
U.P. (West) (including Uttaranchal)	1000	100	15	12	18	30	60	10%
U.P. (East)	1000	100	15	12	18	30	60	10%
West Bengal (including Calcutta)	1000	100	25	20	30	50	100	10%
<b>Category C Circles</b>								
Andaman & Nicobar	20	2	1	0.8	1.2	2	4	8%
Assam	500	50	5	4	6	10	20	8%
Bihar (including Jharkhand)	500	50	10	8	12	20	40	8%
Himachal Pradesh	200	20	2	1.6	2.4	4	8	8%
Jammu & Kashmir	200	20	2	1.6	2.4	4	8	8%
North-East	200	20	2	1.6	2.4	4	8	8%
Orissa	500	50	5	4	6	10	20	8%

**Annexure IV : Number of GSM Operators in EU Countries (Page 1 of 2)**

<b>Sl.No.</b>	<b>Name of the Country</b>	<b>No. of GSM Operators</b>
1	Austria	4
2	Belguim	3
3	Czech Republic	3
4	Denmark	4
5	Estonia	3
6	Finland	6
7	France	3
8	Germany	4
9	Greece	3
10	Hungary	3
11	Iceland	6
12	Ireland	3
13	Italy	4
14	Lithuania	3
15	Netherlands	5
16	Poland	3
17	Portugal	3
18	Romania	3
19	Spain	3
20	Sweden	3
21	Switzerland	3
22	United Kingdom	4



**Annexure IV : Number of GSM Operators in Asia Pacific Countries (Page 2 of 2)**

<b>Sl.No.</b>	<b>Name of the Country</b>	<b>No. of GSM Operators</b>
1	China	2
2	Australia	4
3	Hong Kong	6
4	Indonesia	3
5	Malaysia	5
6	Philippines	3
7	Singapore	3
8	Taiwan	6
9	Thailand	3

**Annexure V: Number of CMSPs and BSOs in India**  
(as on March 2003)

S.No.	Circle	No. of CMSPs	No. of BSOs
1	Delhi	4	4
2	MH	4	4
	Mumbai	4	
3	TN	4	4
	Chennai	4	
4	WB	2	2
	A & N	1	2
	Kolkata	4 (One operator yet to start their service)	
5	Gujarat	4	3
6	AP	4	3
7	Karnataka	4	4
8	Kerala	4	2
9	Punjab	4 (One operator yet to start their service)	3
10	Haryana	4	3
11	UP (W)	3	2
12	UP (E)	3 (One operator yet to start their service)	2
13	Rajasthan	4 (One operator yet to start their service)	3
14	MP	4	3
15	HP	4 (One operator yet to start their service)	2
16	Bihar	2	2
17	Orissa	2	2
18	Assam	2 (One operator yet to start their service)	1
19	NE	2 (One operator yet to start their service)	1
20	J&K	1 (Operator yet to start their service)	1

## Annexure VI : Allocation of Spectrum in EU Countries (Page 1 of 2)

Sl.No.	Name of the Country	No. of GSM Operators	Total Frequency made available for GSM Service**	Average GSM Frequency per operator
1	Austria	4	2 x 59.6 MHz	2 x 14.9 MHz
2	Belguim	3	2 x 81.0 MHz	2 x 27.0 MHz
3	Czech Republic	3	2 x 49.8 MHz	2 x 16.6 MHz
4	Denmark	4	2 x 109.6 MHz	2 x 27.4 MHz
5	Estonia	3	2 x 51.6 MHz	2 x 17.2 MHz
6	Finland	6	2 x 70.8 MHz	2 x 11.8 MHz
7	France	3	2 x 74.4 MHz	2 x 24.8 MHz
8	Germany	4	2 x 80.0 MHz	2 x 20.0 MHz
9	Greece	3	2 x 45.0 MHz	2 x 15.0 MHz
10	Hungary	3	2 x 68.6 MHz	2 x 22.9 MHz
11	Iceland	6	2 x 69.6 MHz	2 x 11.6 MHz
12	Ireland	3	2 x 62.4 MHz	2 x 20.8 MHz
13	Italy	4	2 x 71.6 MHz	2 x 17.9 MHz
14	Lithuania	3	2 x 43.4 MHz	2 x 14.5 MHz
15	Netherlands	5	2 x 105.8 MHz	2 x 21.2 MHz
16	Poland	3	2 x 48.8 MHz	2 x 16.3 MHz
17	Portugal	3	2 x 41.8 MHz	2 x 13.9 MHz
18	Romania	3	2 x 32.0 MHz	2 x 10.7 MHz
19	Spain	3	2 x 64.2 MHz	2 x 21.4 MHz
20	Sweden	3	2 x 75.0 MHz	2 x 25.0 MHz
21	Switzerland	3	2 x 79.6 MHz	2 x 26.5 MHz
22	United Kingdom	4	2 x 105 MHz	2 x 26.3 MHz

**Average per Country** **2 x 67.71**

**Average per GSM Operator** **2 x 18.8 MHz**

\*\* Includes frequencies in 900 MHz, 1800 MHz & E-GSM bands

