

**[File No.402-30/2001-FN (pt)]**  
**Telecom Regulatory Authority of India**

**NOTIFICATION**

**New Delhi**

**20<sup>th</sup> January 2004**

In exercise of the powers conferred upon it under clause (v) of section (1)(b) of section 11 of Telecom Regulatory Authority of India Act, 1997, as amended by, TRAI (Amendment) Act, 2000 in regard to laying down the standards of quality of service to be provided by the service providers, the Telecom Regulatory Authority of India hereby makes the following Regulation:

**REGULATION ON QUALITY OF SERVICE**  
**FOR**  
**VOIP BASED INTERNATIONAL LONG DISTANCE SERVICE( FIRST**  
**AMENDMENT), 2004**  
**(1 of 2004)**

**Section-I**

**Title, Extent and Commencement**

**Short title, extent and commencement**

1. i) The title of this regulation shall be called '**Regulation on Quality of Service for VOIP based International Long Distance Service (First amendment), 2004**'
- ii) This regulation shall come into effect from the date of its notification in the Official Gazette.

## Section-II

### 2. Definitions

The following shall be added in Clause 2 under Section II of “Regulation on Quality of Service for VOIP based International Long Distance Service, 2002 (3 of 2002)” dated 15<sup>th</sup> November 2002 (Principle Regulation).

x) **The Advantage Factor** : The E-Model provides for advantage factor allowing downward adjustment in the R-value required in situations where the user is being provided a certain “advantage”; or some specific transmission media is used for instance international connection with satellite link.

Example:- When VOIP technology is used in an international connection with satellite link, service may be considered Toll Quality even if the end-to-end delay exceeds 150 ms, but is below 400 ms due to the Advantage Factor of 10 points in R-value.

## Section-III

### **3.0 Determination of QOS**

3.1 Clause 4.1.1 Section IV of Principal Regulation shall be substituted to read as under:

“The ILD segment of the network will be engineered to meet the following end-to-end service quality parameters;

#### **4.1.1.1 Toll Quality Networks:**

- MOS > 4 or R-value of 80 or higher (with advantage factor in case of international satellite link involved in which case MOS > 3.5 or R- value > 70 shall be acceptable).
- One-way end-to-end delay < 150ms without satellite link and < 400 ms with satellite link.

- Packet loss not to exceed 0.1%
- Jitter should not exceed 5 ms
- Transparency to DTMF tones
- Services covered in addition of voice to include : G3  
Fax; voice band modem @ 14.4 kbps or higher.”

3.2 Clauses 4.1.1.2, 4.1.2.2 Section IV of Regulation on Quality of Service for VOIP based International Long Distance Service, 2002 shall be deleted.

#### **Section-IV**

This Regulation contains at Annex A, an explanatory memorandum to provide clarity and transparency to matters covered under this Regulation.

**BY ORDER**

**S.N.GUPTA**  
**ADVISOR (Converged Networks)**

**EXPLANATORY MEMORANDUM**

1. The Authority specified benchmarks for ILD networks engineered by employing VOIP technology vide Regulation on Quality of Service for VOIP based International Long Distance Service, 2002 (3 of 2002) dated 15<sup>th</sup> November 2002.
2. As, at that time VOIP technology was not considered to be matured enough and so Authority specified two classes of QOS for this namely Toll Quality and Below Toll Quality. It was and also stated that Authority may review and modify the regulation on reference from any effected party, and for good and sufficient reasons.
3. The Authority is in receipt of some representations from ILD operators and also from Licensor, indicating difficulties in implementing the benchmarks of the above regulation particularly when satellite link is involved.
4. The Authority has noted that the boundary between “Toll quality” and “below Toll quality” is getting blurred because of advancement of technology for VOIP, making it easier now to deliver toll quality using VOIP network.
5. Authority has also noted that none of the ILDOs including incumbent are offering “below Toll quality” service and therefore decided not to specify any benchmarks for “below Toll quality” service / network.
6. Therefore, Authority has modified the QOS benchmarks to merge both the classes of QOS into one and by applying the concept of advantage factor to provide some downward adjustment in QOS benchmarks in case international satellite link is involved in the network.