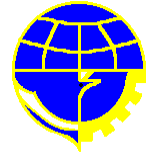




International Civil Aviation Organization and the Directorate General of Air Communication, Indonesia

## SIXTH MEETING OF AERONAUTICAL TELECOMMUNICATION NETWORK (ATN) TRANSITION TASK FORCE OF APANPIRG



Bali, Indonesia, 26-30 April 2004

**Agenda Item 7: Review status of implementation of AFTN circuits, evaluated circuit capacity and consider timescale for transition to ATN**

### **CALCULATION OF AFTN CIRCUIT LOADING STATISTICS FOR THE INTERNATIONAL CIRCUITS OPERATING ON X.25 PROTOCOL**

(Presented by Sri Lanka)

#### **SUMMARY**

This Paper presents the methodology adopted by Sri Lanka in calculating AFTN Circuit Loading Statistics of its Message Switching Center at Colombo, for the circuits operating on X.25 Protocol. The paper also supplements sample statistics generated using this methodology.

#### **1. Introduction**

Sri Lanka upgraded its international AFTN circuits with Singapore and Mumbai to operate on the X.25 protocol in May 2003 as per the ICAO guidelines. Accordingly it was required to formulate a scheme for the calculation of circuit loading statistics in the new X.25 circuits.

#### **2. Discussion**

2.1 The Attachment 'A' shows the network diagram for the two international AFTN circuits operating on the X.25 Protocol.

a. The Point-to-Point X.25 Circuit from Colombo to Mumbai operates at 64 Kbps.

b. The effective data rate of the point-to-point X.25 Circuit from Colombo to Singapore has become 9.6 Kbps, as a result of Singapore end being operated at 9.6 Kbps, although the International Private Leased Circuit (IPLC) and the X.25 interface at Colombo end operate at 64 Kbps.

2.2 The X.25 Multiplexer at Colombo AFTN Switch is capable of generating the figures for the total number of bytes transmitted and received including X.25 overheads for each circuit for a given duration.

2.3 It is possible to calculate the maximum number of bytes that can be transmitted or received for each X.25 circuit for a given duration, knowing the data rate of each circuit. The following table summarizes the maximum numbers of bytes that can be transmitted or received for each X.25 circuit.

| AFTN Circuit | Data Rate | Maximum<br>Number of Bytes<br>per Hour | Maximum<br>Number of Bytes<br>per Day |
|--------------|-----------|----------------------------------------|---------------------------------------|
| Mumbai       | 64 Kbps   | 28,800,000                             | 691,200,000                           |
| Singapore    | 9.6 Kbps  | 4,320,000                              | 103,680,000                           |

2.4 Therefore, it is possible to calculate the circuit loading for the peak hour or for the day, by dividing the number of bytes transmitted / received which is obtained from item 2 above, by the relevant maximum throughput value shown in the above table.

2.5 The sample statistics prepared using the above methodology is given in the attachment "B".

### **3. Action by the Meeting**

The meeting is required to review the methodology presented in this paper and to make appropriate recommendations.

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Attachment "B"

**AFTN CIRCUIT LOADING STATISTICS**  
**FOR THE INTERNATIONAL CIRCUITS OPERATING ON X.25 PROTOCOL**

|                       |         |                    |      |
|-----------------------|---------|--------------------|------|
| Originating Station   | Colombo | Location Indicator | VCCC |
| Corresponding Station | Mumbai  | Location Indicator | VABB |
| Data Rate             | 64 Kbps | No. of Channels    | 1    |

| Average Loading |               | INPUT 0.0249% |         |         |                | OUTPUT 0.1149% |         |         |  |
|-----------------|---------------|---------------|---------|---------|----------------|----------------|---------|---------|--|
| Date            | STATION INPUT |               |         |         | STATION OUTPUT |                |         |         |  |
|                 | Peak Hour     | Peak Hour     | Total   | Daily   | Peak Hour      | Peak Hour      | Total   | Daily   |  |
|                 | Byte Count    | Percent       | Daily   | Percent | Byte Count     | Percent        | Daily   | Percent |  |
| 23/10/2003      | 20,428        | 0.0709        | 201,862 | 0.0292  | 49,489         | 0.1718         | 744,202 | 0.1077  |  |
| 24/10/2003      | 17,663        | 0.0613        | 153,998 | 0.0223  | 68,213         | 0.2369         | 754,405 | 0.1091  |  |
| 25/10/2003      | 16,812        | 0.0584        | 161,051 | 0.0233  | 91,034         | 0.3161         | 883,577 | 0.1278  |  |

|                       |           |                    |      |
|-----------------------|-----------|--------------------|------|
| Originating Station   | Colombo   | Location Indicator | VCCC |
| Corresponding Station | Singapore | Location Indicator | WSSS |
| Data Rate             | 9.6 Kbps  | No. of Channels    | 1    |

| Average Loading |               | INPUT 0.9599% |           |         |                | OUTPUT 0.0623% |        |         |  |
|-----------------|---------------|---------------|-----------|---------|----------------|----------------|--------|---------|--|
| Date            | STATION INPUT |               |           |         | STATION OUTPUT |                |        |         |  |
|                 | Peak Hour     | Peak Hour     | Total     | Daily   | Peak Hour      | Peak Hour      | Total  | Daily   |  |
|                 | Byte Count    | Percent       | Daily     | Percent | Byte Count     | Percent        | Daily  | Percent |  |
| 23/10/2003      | 57,772        | 1.3373        | 909,699   | 0.8774  | 5,491          | 0.1271         | 59,478 | 0.0574  |  |
| 24/10/2003      | 78,506        | 1.8173        | 979,113   | 0.9444  | 3,997          | 0.0925         | 58,084 | 0.0560  |  |
| 25/10/2003      | 116,055       | 2.6865        | 1,096,929 | 1.0580  | 7,974          | 0.1846         | 76,337 | 0.0736  |  |