Recommendation E.540

OVERALL GRADE OF SERVICE OF THE INTERNATIONAL PART OF AN INTERNATIONAL CONNECTION

1 The International Routing Plan envisages that international traffic relations may be served by any of the following routing arrangements:

a) direct circuits;

b) transit operation involving one or more transit centres for all connections,

c) direct high—usage circuits with overflow via one or more transit centres.

In principle there would be merit in dimensioning international facilities to provide the same grade of service for all relations, however served. Practical considerations make it advisable to depart from one universal value.

2 Direct circuit groups are dimensioned, according to Recommendation E.520 on the basis of $p = 1\%$ loss probability during the mean busy hour. An exception is permitted for small groups of very long international circuits for which $p = 3\%$ loss probability is accepted for six or fewer circuits. As the traffic increases the grade of service improves progressively until $p = 1\%$ loss value is reached for 20 circuits.

3 For the relations served exclusively by transit operation the grade of service will deteriorate with the number of transit centres in the connection. Measurements made on congestion in such circumstances suggest that the overall grade of service for up to six links in tandem is less than twice the congestion of any of the six links in the chain. Hence, for a series of routes, each dimensioned for $p = 1\%$, the overall grade of service should seldom exceed 2%. An East—West type of connection would have the advantage of different busy hours on the various links. Corresponding advantage would not apply to North—South circuits.

In the case of relations served by high—usage circuits the overflow traffic will route over at least two links and, hence, will be subject to the same deterioration of service as in the case for transit traffic. However, a substantial part of the traffic will be connected over the high—usage circuits and the overall grade of service will approximate that of the relations served solely by direct circuits.

It is desirable that at least one high—usage circuit should always be provided between a CT3 and its homing CT1, even though the circuit may not be wholly justified on economic considerations alone. However, such a circuit should not be provided unless there is a measurable amount of traffic which exists, or can be foreseen in the busy hour. The provision of such circuits would improve the transmission as well as the grade of service; these considerations should encourage an increase both in traffic and in the revenue—earning capacity of the circuits provided.

The overall grade of service for the international part of a connection is a contributory factor to the overall grade of service from the calling party in one country to the called party in another.