

## RECOMMENDATION ITU-R V.665-2\*, \*\*

## TRAFFIC INTENSITY UNIT

(1986-1990-2000)

**Scope**

This Recommendation defines the variable “traffic intensity” and the unit used: the erlang (E).

The ITU Radiocommunication Assembly,

*considering*

a) that in ITU-T texts concerning telephone operations and tariffs and in ITU-R texts concerning radiotelephone transmissions (e.g. telephone radio-relay systems and the maritime mobile service radiotelephony), the quantity “traffic intensity” is used together with the unit in which it is expressed. With progress in telecommunications, increasing use will be made of this term and this unit;

b) that the variable “traffic intensity” and its unit “erlang” are defined in ITU-T Recommendation E.600 and reproduced below,

*recommends*

1 that for telecommunication purposes, the following definitions should be used:

**traffic intensity:** The instantaneous traffic intensity in a pool of resources\*\*\* is the number of busy resources at a given instant of time.

NOTE 1 – Statistical moments may be calculated for a given period of time, for instance the mean traffic intensity  $\bar{A}(t_1, t_2)$  is related to the instantaneous traffic intensity  $A(t)$  as:

$$\bar{A}(t_1, t_2) = \frac{1}{t_2 - t_1} \int_{t_1}^{t_2} A(t) dt$$

In applications, the term traffic intensity usually has this meaning of mean traffic intensity.

NOTE 2 – Traffic intensity is equivalent to the product of arrival rate and mean holding time.

NOTE 3 – The unit usually used for traffic intensity is the erlang (symbol: E).

**erlang:** Unit of traffic intensity (symbol: E). 1 erlang is the traffic intensity in a pool of resources when just one of the resources is busy.

NOTE – The name “erlang” was given to the traffic unit in 1946 by the CCIF, in honour of the Danish mathematician, A. K. Erlang (1878-1929), who was the founder of traffic theory in telephony.

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\* See also ITU-T Recommendation B.18 (1993).

\*\* This Recommendation was updated in 2005 for editorial reasons only.

\*\*\* The term “resource” means any physically or conceptually identifiable entity, whose use and state at any time can be unambiguously determined, for example, a telecommunication circuit, a switching equipment, a subscriber line or a radio channel.