INTERNATIONAL TELECOMMUNICATION UNION

ITU-T   Q.267

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

SPECIFICATIONS OF SIGNALLING SYSTEM No. 6

SIGNALLING PROCEDURES

UNREASONABLE AND SUPERFLUOUS MESSAGES

ITU-T Recommendation Q.267

(Extract from the *Blue Book*)

NOTES

1   ITU-T Recommendation Q.267 was published in Fascicle VI.3 of the *Blue Book*. This file is an extract from the *Blue Book*. While the presentation and layout of the text might be slightly different from the *Blue Book* version, the contents of the file are identical to the *Blue Book* version and copyright conditions remain unchanged (see below).

2   In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

Recommendation Q.267

4.7 UNREASONABLE AND SUPERFLUOUS MESSAGES

4.7.1 *General*

The characteristics of the common channel signalling system may give rise to irregularities such as:

- *unreasonable messages,* i.e. messages with:

    an inappropriate signal content,

    an incorrect signal direction, or

    an inappropriate place in the signal sequence;

- *superfluous messages.*

4.7.2 *Reasonableness check tables*

In order to resolve ambiguous situations which may arise from these irregularities, special procedures must be defined. These procedures, some of which are mandatory, are included in the reasonableness check tables given in Annex B to these Specifications, which cover all possible stages in the signalling sequences.

The justification for using such tables follows from the dependability requirements in Recommendation Q.276, § 6.6.1.

### 4.7.3 *Retransmissions and undetected errors*

The following three cases may be considered as examples of the occurrence of unreasonable or superfluous messages:

- in case a signal unit received in error is retransmitted and the next signal unit of the same call is received in advance of the retransmitted signal unit, the signal units are received in reverse order and thus appear unreasonable;

- the incidence of an undetected error may alter the meaning of a signal unit, which then becomes unreasonable,

- in case the acknowledgement for a transmitted signal unit is not received (due to an ACU being received in error or drift compensation), this signal unit may be received twice, so that the second appearance of the signal unit is superfluous.

Examples:

a) *Disturbed signal sequence*

When a reanswer signal is received before a clear-back signal is retransmitted owing to a detected error:
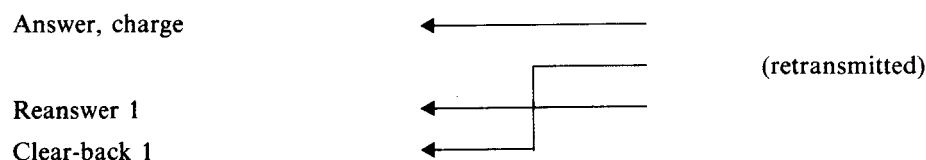
The reanswer signal is conditionally accepted pending receipt of the clear-back signal.

b) *Undetected error*

When a forward-transfer signal is received in an unreasonable place or direction in a call sequence owing to an undetected error:

Initial address message   ⟶

Continuity   ⟶

Forward-transfer   ⟵   (undetected error)

The forward transfer signal is rejected.

c) *Superfluous message*

When two initial address messages are received owing to an ACU being received in error or to drift compensation:

Clear-forward (call 1)   ⟶

Release-guard (call 1)   ⟵

Initial address message (call 2)   ⟶

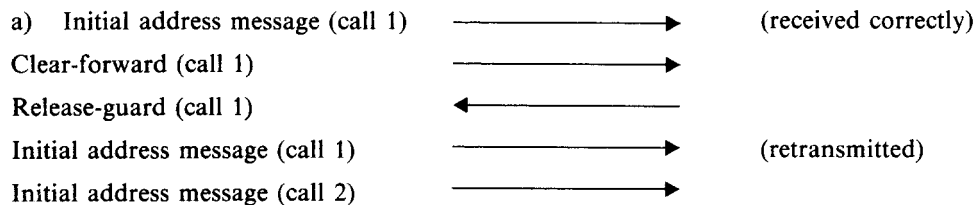Initial address message (call 2)   ⟶   (retransmitted)
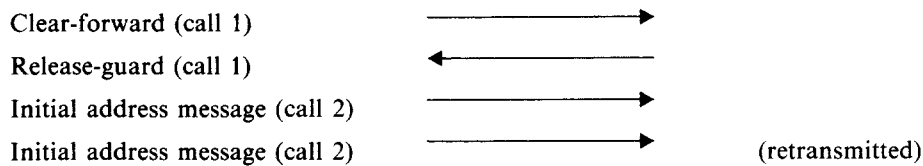
The receipt of two initial address messages would call for the contents to be compared. Should the two be identical, one or the other is discarded.

4.7.4   *Spill-over of messages from one call sequence to another*

In the event of a new call following immediately after the completion of a previous call, there could be a spill-over of messages from the first call to the second, viz. if a signal unit of the first call is received correctly a second time owing to a retransmission. This could lead to ambiguous situations as illustrated in the following examples. The reasonableness check tables given in Annex B to these Specifications contain the procedures for these cases.
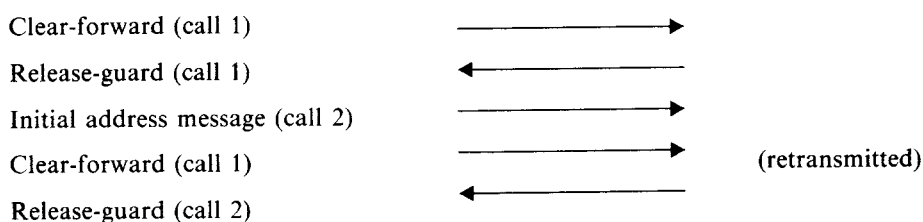
Examples:

a)   Initial address message (call 1)   ⟶   (received correctly)

Clear-forward (call 1)   ⟶

Release-guard (call 1)   ⟵

Initial address message (call 1)   ⟶   (retransmitted)

Initial address message (call 2)   ⟶

This sequence has a similar appearance to the one arising when an initial address message is received a second time owing to an ACU being received in error or to drift compensation without an intervening clear-forward signal; see example c) in § 4.7.3 above. The contents of the two initial address messages should be compared. Should the two be different, the call can be rejected by sending a *confusion signal* in the backward direction.

On receipt of the confusion signal, the System No. 6 exchange will send a clear-forward signal for the circuit in question, after which an automatic repeat attempt of the call will be made.

b)   Another example of a spill-over could occur if an ACU acknowledging a clear-forward signal is received in error and another call is initiated on the circuit just cleared. The sequence would be:

Clear-forward (call 1)   ⟶

Release-guard (call 1)   ⟵

Initial address message (call 2)   ⟶

Clear-forward (call 1)   ⟶   (retransmitted)
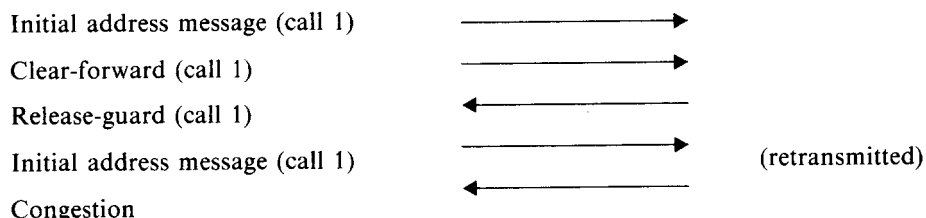
Release-guard (call 2)   ⟵

The processor receiving the release-guard signal does not know whether it was generated in response to a retransmitted clear-forward signal or whether it was the result of an incoming undetected error.

In this case, the exchanges disagree as to the state of the circuit (seizure or release) and the specified procedure must be followed to remove the ambiguity.

4.7.5 *Other ambiguous situations*

Another ambiguous situation could arise for example if, after transmitting a clear-forward signal, an ACU is received in error resulting in the superfluous retransmission of the initial address message. If the latter is followed by a backward signal, for example the congestion signal, the sequence would be:

Initial address message (call 1)	──────────▶
Clear-forward (call 1)	──────────▶
Release-guard (call 1)	◀──────────
Initial address message (call 1)	──────────▶ (retransmitted)
Congestion	◀──────────

The processor receiving the congestion signal will find the associated circuit in the idle condition and assume the signal to be invalid. The processor at the other end will keep the circuit busy while waiting for the clear-forward signal.

In this case, the exchanges disagree as to the state of the circuit (idle or busy) and the specified procedure must be followed to remove the ambiguity.

4.7.6 *Procedures for the treatment of unreasonable and superfluous messages*

4.7.6.1 *Rejecting*

Messages or signal units recognized to be unreasonable or superfluous are discarded.

4.7.6.2 *Waiting*

Unreasonable messages or signal units which may become meaningful at a later stage of the signal sequence are provisionally held. The waiting time should be longer than the retransmission delay of the delayed message. The provisionally-held signal units are processed if the arrival of retransmitted signals within the waiting period makes them meaningful. Otherwise, if they are still meaningless at the end of the waiting period, they are rejected with the exception of the case where the held signal is a clear-forward signal. In this case, the release-guard signal must be sent.

4.7.6.3 *Clearing*

If due to an abnormal signal sequence an ambiguous situation arises, which would result in a circuit being held unduly for a prolonged time, the circuit should be cleared in the normal way.

4.7.6.4 *Sending the confusion signal*

If none of the above procedures is suitable for resolving the situation created by the receipt of an unreasonable message (§ 4.7.1 above), the confusion signal is sent back to the preceding System No. 6 exchange. The confusion signal will not be sent subsequent to sending the address-complete signal or other signal causing the release of address and routing information at the preceding System No. 6 exchange (see § 4.8.1 below).

On receipt of the confusion signal, the preceding System No. 6 exchange will send the clear-forward signal, after which an automatic repeat attempt will be made of the call to be completed as in § 4.7.4, a) above, otherwise the clear-forward signal will be sent.

4.7.7 *Mandatory procedures*

Of the procedures contained in the reasonableness check tables, only those are mandatory which apply to situations in which:

- processors at either end of the link disagree as regards the state of a circuit, or

- cooperation between the processors at either end of the link is required to resolve the ambiguous situation.

Compelled sequences such as clear-forward release-guard must always be completed irrespective of whether the occurrence of the first signal appears reasonable or not.