MEMORANDUM CIRCULAR
NO. 10-17-90

SUBJECT: NATIONAL SERVICE PERFORMANCE STANDARDS FOR TELECOMMUNICATIONS SERVICES (TELEPHONE, TELEGRAPH AND TELEX SERVICES)

Pursuant to the powers vested upon the National Telecommunications Commission (NTC) by Executive Order 546, Act 3846, as amended, CA 146, as amended and other related laws authorizing it to establish and prescribe rules, regulations, standards and specifications in relation to issued Certificates of Public Convenience and Necessity, and to administer and enforce the same, as public safety and interest so requires, the Commission hereby promulgates this National Service Performance Standards for Telecommunications Services particularly telephone, telegraph and telex services.

I. GENERAL

1.1 Scope

1.1.1 All telecommunications companies operating in the Republic of the Philippines shall adhere to the requirements established under the National Service Performance Standards.

1.1.2 The National Service Performance Standards define the quality of service to be rendered by all telecommunications companies operating in the Republic of the Philippines.

1.1.3 Values and specifications indicated in the National Performance Standards are minimum requirements and can always be exceeded for better service performance.

1.2 Principles

1.2.1 A telecommunications company is obliged to provide the best quality of service to its customer to a degree of satisfaction

1.2.2 Providing performance measured ensure the satisfactory operation of a telecommunications company.

1.2.3 Improved service to the customer will result in improved customer relations, stimulation of customer calling rate and eventually increased revenue.

2. TELEPHONE SERVICE

2.1 Network Status and Performance Data

2.1.1 In order to identify where and when difficulties are occurring in the network, or are likely to occur, data will be required which will

indicate the status and measure the performance of the network. Such data will require real-time collection and processing.

2.1.2 Data may be collected using various devices which range from electromechanical counters, which are read manually when, required (e.g. during periods of heavy traffic or special events), to computerized systems which provide processed data automatically.

2.1.3 Network status information includes information on the status of switching centers, circuit groups and common channel signalling systems.

2.1.3.1 Switching center status information relates to the following:

Load measurement – These are provided by attempt counts, usage or occupancy data, data on the percent real-time capacity available (or in use), blocking rates, percentage of equipment in use, counts of second trials, etc.

Congestion measurement – These are provided by measurements of the delay in serving incoming calls, holding times of equipment, average call processing and set-up time, queue lengths of common control equipment (or software queues), and counts of equipment time-outs, etc.

Service availability of switching center equipment – This information could highlight a cause of difficulty or give advance warning that difficulties could arise if demand increase. Information can be provided which shows when major items of equipment are made busy to traffic.

Congestion indicators – In addition to the above, indicators can be provided by SPC exchanges, which show levels of congestion. These indicators can show:

- no congestion level 0 (clearing signal)
- moderate congestion level 1
- serious congestion level 2
- unable to process calls level 3

The availability of specific switching center status information will depend on the switching technology employed by each Administration.

2.1.3.2 Circuit group status information relates to the following:

- status of all routes available to a destination;
- status of circuits on each routes.

Status indicators should be provided to show:

a. when the available network is fully utilized by indicating:

- when all circuits in a route are busy;
- when all routes available to a destination are busy.

This would indicate that congestion is imminent.

b. the availability of the network for service, by indicating the number or percentage of circuits on each route that are made busy or are available for traffic.

This information could identify the cause of difficulty or give advance warning that difficulties may arise as the demand increase.

2.1.3.3 Common channel signalling system status provides information that will indicate failure or signalling congestion within a system. It includes such items as:

- receipt of a transfer prohibited signal (Signalling System Nos. 6 and 7)
- initiation of an emergency restart procedure (Signalling System No. 6),
- presence of a signalling terminal buffer overflow condition (Signalling System No. 6),
- signal link unavailability (Signalling System No.7)
- signal route unavailability (Signalling System No.7)
- destination inaccessible (Signalling System No.7)

Note: For details of Signalling Systems Nos. 7 & 6 see CCITT Recommendation Vol. VI, Fascicle VI. 3, VI.7, VI.8, and VI.9.

This information may identify the cause of difficulty in the network.

2.1.4 Network performance data should relate to the following:

- traffic performance on each route:
- traffic performance to each destination;
- effectiveness of network management actions.

It is desirable to assemble performance data for each direction of traffic flow in terms of route and destination combinations and traffic class (for example, operator dialed, subscriber dialed, transit).

Data for network management purpose are derived from bids, seizures, answer signals, clears and the times of their occurrence.

Data collection should be based on a system of measurements which is either continuous or of sufficiently rapid sampling rate my need to be as frequent as every second.

Data reports may be provided on a 5 – minute, 15 – minute, 30 - minute or hourly basis.

2.2 Network Performance Parameters

2.2.1 Percentage Overflow (% OFL)

% OFL indicates the relationship between the total bids offered to a route or destination, in a specified period of time, and the quantity of bids not finding a free circuit. It will therefore, give an indication of the overflow from one route to another, or the bids which fail because all routes to a destination are busy.

$$\%OFL = \frac{\text{Overflow bids}}{\text{Total bids for the route (or all routes)}} \times 100$$

2.2.2 Bids per Circuit per Hour (BCH)

BCH is an indication of the average number of bids per circuit, in a specified time interval. It will therefore identify the demand and, when measured at each end of a both-way-operated route, will identify the direction of greater demand.

$$BCH = \frac{\text{Bids per hour}}{\text{Quantity of circuits available for service}}$$

2.2.3 Answer Seizure Ratio (ASR)

ASR gives the relationship between the number of seizures that result in an answer signal and the total number of seizures. This is

a direct measure of effectiveness of the service being offered from the point of measurement and is usually expressed as a percentage as follows:

$$ASR = \frac{\text{Seizure resulting in answer signal}}{\text{Total Seizures}} \times 100$$

2.2.4 Answer Bid Ratio (ABR)

ABR gives the relationship between the number of bids that result in an answer signal and the total number of bids. ABR is measured on a destination basis.

$$ABR = \frac{\text{Bids resulting in answer signal}}{\text{Total Bids}} \times 100$$

ABR is expressed as a percentage and is a direct measure of the effectiveness of traffic from the point of measurement. It is similar to ASR except that it includes bids that do not result in a seizure.

2.2.5 Seizures per Circuit per Hour (SCH)

SCH is an indication of the average number of times, in a specified time interval, that each circuit in a route is seized. When related to the expected values of average call holding times and effective call/seizure rate for the route, it will give an indication of the effectiveness of the service being offered.

$$SCH = \frac{\text{Seizures per Hour}}{\text{Quantity of circuits available for service}}$$

It is not necessary to accumulate data for an hour to compute SCH.

2.2.6 Occupancy

Occupancy can be represented in units (for examples, erlangs, hundred calls-seconds (CCS) or as a percentage. It can be measured as a total for a destination or for a route and as an average per circuit on a route. This parameter will show usage and identify unusual traffic levels.

2.2.7 Mean Holding Time per Seizure

This is the total holding time divided by the total number of seizures and can be calculated on a route basis or for switching equipment.

Note: International networks contain one-way and both-way operated circuits and their traffic flow characteristics are inherently different. This difference needs to be taken into account when calculating BCH and SCH either by:

a. multiplying the number of one-way circuits by 2 to derive an equivalent number of both-way circuits or:
b. dividing the number of both-way circuits by 2 to derive an equivalent number of one-way circuits.

2.3 MEASUREMENTS

The quality of service provided by the network operator can be measured either with mechanized or automatic measuring devices or by manual measurements using simulated calls or manual measuring devices.

2.3.1 Grade of Service - %OFL is measured by traffic register for a one continuous Busy Hour. Busy Hour is defined as the continuous one-hour when traffic is at its peak. On a per year basis, GOS is the average % OFL taken for the seven (7) of the least peak busy hour out of the ten (10) peak busy hour of the year.

On a simulated call basis, service observation is conducted by manually generating calls to a predetermined called number during the busy hour. Normal call generation is 200/1000 working lines. The busy hour GOS is determined by:

$$\frac{\text{number of block calls}}{\text{total number of calls made}} \times 100$$

2.3.2 Dial Tone Delay – Measurement equipment is available in the market to automatically measure dial tone delay. An alternative is to take manual measurement by using a stopwatch. During the busy hour, the elapsed time is measured between the receiver-off-hook and the reception of dial tone. Measurement shall be made several times during the busy hour on a typical business day and at least three times a month for a one-year period.

$$\text{Dial tone delay} = \frac{\text{no. of bids exceeding } > \text{N second dial tone delay}}{\text{total bids}} \times 100$$

2.3.3 Call Completion Rate – Measurement can be mechanized by the use of service observation equipment. Calls are tracked by machine on a random available numbers at the exchange and the corresponding elapse time after answer back supervision is noted. Call completion rate is determined by:

$$\frac{\text{no. of seizures tracked with answer supervision > N second}}{\text{total no. of seizures}} \times 100$$

2.3.4 Processing Time – This is a parameter that applies only to switching equipment classified as stored program control (SPC). Value is determined by:

$$\frac{\text{total of bids – no. of bids > N seconds past dialing delay}}{\text{total no. of bids}} \times 100$$

2.4 INTERPRETATION OF PARAMETERS

The interpretation of parameters on which network management actions are based can most conveniently be made by considering the originating international/national-switching center as the reference point (see Fig. 1).

From this reference point, the factors, which affect call completion, can broadly be divided into three main components:

- switching loss (near-end loss);
- circuit congestion loss (near-end loss);
- distant network loss (far-end loss).

2.4.1 Switching Loss

2.4.1.1 Common equipment or switchblock congestion;
2.4.1.2 Failure in coming signaling;
2.4.1.3 Subscriber/operator dependent errors, such as insufficient or invalid digits, premature call abandonment, etc;
2.4.1.4 Routing errors, such as barred transit access;
2.4.1.5 Other technical failures.

Guidance to the identification of switching loss can be obtained from sec 2.1.3.

2.4.2 Circuit Congestion Loss

This loss will depend on:

2.4.2.1 the number of circuits available for destination, and;
2.4.2.2 the level of demand for that destination.
Indication that circuit congestion loss may occur can be obtained from the status information detailed in sec.2.1.3.2 above.

Circuit congestion loss can be identified by any of the following;

- percentage overflow
- a difference between the 'bids per circuit per hour" and "seizures per circuit per hour" measurements on the final route.
- a difference between the "answer bid ratio" and the "answer seizure ratio".

It should be noted that for both-way operated routes, excessive demand on the incoming direction may also cause congestion loss. This can be identified by measuring "bids per circuit per hour" or occupancy at each end of the routes.

2.4.3 Distant Network Loss

Distant network loss may be divided into:

2.4.3.1 technical loss: due to distant switching center and national circuit faults.
2.4.3.2 subscriber dependent loss: due to subscriber B busy, no answer, invalid distant number, number unavailable, etc.
2.4.3.3 traffic dependent loss: these losses are due to lack of distant network capacity to meet traffic demand.

Under normal conditions and for large sample measured over a long period, distant network loss can be said to have a fixed or ambient overhead loss (this value depends on destination with some diurnal and day-by-day variations).

Under abnormal situations (heavy demand, failures, etc.) distant network losses cab be significantly affected. Variations in distant network loss cab be identified by any of the following:

- answer seizure ratio. This is a direct measurement.
- seizure per circuit per hour. This is an indirect measurement.
- mean holding time per seizure. This is an indirect measurement.

2.5 QUALITY OF SERVICE

A measure of service provided to the subscriber.

For the purpose of this standard, long-term objective and short-term objective are defined as 10 and 5 years respectively counted from the date this standard is adopted.

2.5.1 Network Performance

2.5.1.1 Grade of Service

long-term objective – 1% per segment of the network measured during 0 BH.

short-term objective – 2.5% per segment of the network measured during 0 BH.

2.5.1.2 Dial Tone Delay

The time interval between subscriber off hook and reception of dial tone.

long-term - 95% w/in 3 secs.

short-term - 85% w/in 5 secs.

2.5.1.3 Call Completion Rate

The percentage of calls that were able to receive an answer signal measured during the busy hour.

long-term - 60% in BH

short-term - 40% in BH

2.5.1.4 Processing Time

The percentage of calls receiving an answer signal after dialing within a specified period of time.

long-term - 95% in 10 secs.

short-term - 80% in 10 secs.

2.5.2 Inside Plant Maintenance Performance

2.5.2.1 Percent Troubles Cleared

long-term - 95% in 24 hrs.

short-term - 80% in 48 hrs.

2.5.2.2 Trouble Index

a. regular subscriber line

long-term objective - 2/100 lines/mo.

short-time objective - 7/100 lines/mo.

b. repair time-regular subscriber line

long-term objective - 95% in 24 hrs.

short-time objective - 80% in 46 hrs.

2.5.3 Outside Plant Maintenance Performance

2.5.3.1 Trouble Density

long-term objective - 15/100 lines/mo.

short-time objective - 20/100 lines/mo.

2.5.3.2 Troubles per 100 stations per month

long-term objective - 12/100/mo.

short-time objective - 17/100/mo.

2.5.3.3 Clearing time

long-term objective - 95% in 24 hrs.

short-time objective - 75% in 48 hrs.

2.5.3.4 Trouble density – trunking

long-term objective - 1/100/trunks

short-time objective - 3/100/tunks

2.5.3.5 Repair time – trunking

long-term objective - 97% in 24 hrs.

short-time objective - 75% in 48 hrs.

2.5.4 Transmission Performance – is the degree to which a telecommunications system reproduces the offered signal

2.5.4.1 Voice

Idle Circuit Noise - 36 dBrnc

Attenuation (subscriber loop incl. thru CO lines)
- 8.5 dB

Attenuation (junction circuits) – 16 dB (max)

2.5.4.2 Data – Characters of telephone-type leased circuits

a. Ordinary International circuits (also M. 1040).

Receive level at the end office should not be less than 15 dB;

maximum loss in any part of circuits should not exceed 28 dB.

Loss-frequency distortion curve is given in Annex A.

Psophometric noise power limit is given in Annex B;

Satellite circuit between earth stations contributes 10,000 pWOp (-50 dBmOp) of noise.

b. Special-quality leased circuits (also M. 1020).

Receive level, overall loss, and random circuit noise are as given in paragraph A above.

Loss-frequency distortion curve is given in Annex C.

Group-delay distortion is given is Annex D.

Level variations :

Short term (in a few seconds) : ±3 dB,
Long term (daily and seasonal) : ±4dB.

2.5.4.3 Other Parameters

Impulse noise exceeding –21dBmO should not be more than 18 in 15 min.

Phase jitter – Maximum 15 peak to peak

Quantizing noise – If any section of the circuit is routed over PCM system, minimum signal-to-quantizing-noise ratio normally expected is 22 dB.

Single –tone interference shall not exceed the value which is 3 dB below the circuit of Annex B.

Frequency error – Maximum = ±5Hz.

Harmonic distortion – 700 Hz injected at –19 dBmO will be at least 25 dB below fundamental frequency.

2.5.5 Operator Assisted Calls

2.5.5.1 Long Calls Speed of Answer

long-term objective - 85% in 10 secs.

short-time objective - 60% in 10 secs.

2.5.5.2 Toll Calls Speed of Answer

long-term objective - 95% in 10 secs.

short-time objective - 60% in 10 secs.

2.5.5.3 Processing Time

long-term objective - 95% in 15 secs.

short-time objective - 80% in 60 secs.

2.5.6 Commercial Services

2.5.6.1 Billing Accuracy/Complaints

long-term objective - 1/100/mo.

short-time objective - 5/100/mo.

2.5.6.2 Response to Complaints

long-term objective - 90% in 24 hrs.

short-time objective - 90% in 48 hrs.

2.5.6.3 Service Applications Average Processing Time

long-term objective - 90% in 5 work days

short-time objective - 90% in 10 work days

3. TELEGRAPH SERVICE

3.1 Preparation and Handing In of Telegrams

3.1.1 The text and the signature of a telegram may be written in any language provided alphanumeric characters are used.

3.1.2 Every telegram shall have a heading which includes the information needed for identification and, If necessary, for the routing of the telegram

3.1.3 The other parts of the telegrams must be arranged as follows:

3.1.3.1 The address (including the service indication, if any)

- The address must contain all the particulars necessary to ensure delivery of the telegram to the addressee without inquiries or request for further information.
- When a telegram is addressed to a person at the address of another must contain, immediately, after the name of actual addressee, the expression 'care of' or other equivalent expression.

3.1.3.2 The text (including the signature, if any)

3.1.3.3 The routine repetition (if required)

3.1.4 The date and time of handing in of the telegram shall be shown by two groups of figures, the first indicates the day of the month and the second (consisting of a group of four figures) indicates the hours and minutes (0001 to 2400).

3.2 Counting of Words

3.2.1 Everything that the sender asks to have transmitted shall be chargeable, with the exception of the route indication and the name of the code used for the wording of a secret language telegram, when this information is required by the origin or the destination.

3.2.2 Service indications (if any) shall be included in the number of chargeable words in all chargeable telegrams and in the number of actual words in all telegrams.

3.2.3 Words, group of characters or expression not exceeding ten characters shall be counted as one chargeable words each; exceeding ten characters shall be counted at the rate of one chargeable word for each ten characters or part thereof.

3.3 Transmission of Telegrams

3.3.1 Each telegram must be transmitted as received from the sender, except for dashes used only to separate on the sender's copy of the different words or groups; other isolated signs; unless the sender has specifically requested their transmission.

3.3.2 Where a telegram received from the sender already bears a repetition of some groups after the signature, the repeated groups shall be used to check the text of the sender's copy, if necessary in consultation with the sender. When the telegram is transmitted the sender repetition shall be ignored and a routine repetition is prepared.

3.3.2.1 Routine repetition means the repetition in whole or in a part of a telegram by the office responsible for its transmission. Any such operation shall be preceded by the abbreviation COL.

3.3.2.2 For all telegrams, routine repetition shall be compulsory for isolated figures and mixed groups containing figures in the address or text parts.

3.3.2.3 In telegrams of more than 50 words, routine repetition shall be given at the end of every page.

3.3.2.4 Routine repetition may not be delayed or interrupted to give place to a communication of higher priority except in case of absolute urgency.

3.3.3 A telegram must not be refused or delayed because of irregularities in the service instructions, provided, however, that the carrier may refuse to accept defective telegrams that do not conform to specifications as to address, sender's name, address and signature or one that contains language prohibited by pertinent laws and

NTC regulations. The telegram must be accepted and them if necessary, a service advice sent tot he office of origin requesting rectification.

3.3.4 In case of interruption the receiving office shall immediately request the completion of an unfinished telegram and, when necessary, give an acknowledgement of receipt, either by another direct circuit if there is one in service or, if not, by a service advice, forwarded by whatever means is available.

3.3.5 Telegrams shall be delivered or forwarded to their destination in the order of priority, within the time frame as stated in 3.5 except in the cases specified for the delivery of letter telegrams. Telegrams relating to the safety of life as well as government telegrams with priority shall be delivered without delay. In the event the telegram cannot be transmitted, the office of origin shall notify the sender within the time frame as stated in 3.5

3.4 Delivery at Destination

3.4.1 Telegrams shall be delivered by any means available according to their stated address. They are considered delivered if drop in a post office box, received by the addressee himself, or by any member of his household or office possessed with sufficient discretion.

3.4.2 Telegrams addressed to places in locality served by the telegraph office shall be delivered without delay to their addresses subject to the limitations imposed by the working hours of delivery offices. Telegrams received during the night may be delivered immediately if they bear the service indication URGENT.

3.4.3 When a telegram cannot be delivered, the office of destination shall send within the period under 3.5, a service advice to the office of origin and sender stating the cause of non-delivery.

3.5 Telegraph Service Objective Standard

TELEGRAPH SERVICE

Obj. or Key Area of Concern	Long Term Obj. (10 yrs.)	Short Term Obj. (5 yrs.)
End User		
Quality of service		
Reliability		
% Reliability		

Class A or UHF ccts	99.7 %	99.3 %
Class B or VHF ccts	99.6 %	99.2 %
Class C or HF ccts	96.7 %	93.4 %
MTBF		
Class A or UHF ccts	997.00 hrs	567.43 hrs
Class B or VHF ccts	1494.00 hrs	992.00 hrs
Class C or HF ccts	351.64 hrs	240.57 hrs
MTTR		
Class A or UHF ccts	3 hrs	4 hrs/outage
Class B or VHF ccts	6 hrs	8 hrs/outage
Class C or HF ccts	12 hrs	17 hrs/outage
Delivery of message		
Average delivery time		
Regular telegram		
Public ofc – Public ofc		
AB to AB or vice versa	2.5 hrs	5 hrs
AB to C or vice versa	3 hrs	6 hrs
C to C or vice versa	3.5 hrs	47 hrs
Public ofc- msg delivery (from receipt at destination office)		
	3 hrs in town	4 hrs in town
	6 hrs out-of-town	12 hrs out-of-town
Rush or special telegram		
Public ofc - Public ofc		
	2 hrs	4hrs
Public ofc – msg delivery		
	2 hrs	3 hrs
Accuracy of Message Transmitted		
Message error rate	100% w/o error	100% w/o error

Character error rate	0 chars.	0 chars
Telegraph Station Categories		
Class A – Telegraph stations in large cities or cities served by UHF radio circuits.		
Class B – Telegraph station in medium cities or cities served by VHF radio circuits.		
Class C – Telegraph station in small cities or towns or locations served by HF radio circuits.		

4. TELEX SERVICE

4.1 Classes of Operation

4.1.1 Whenever fully automatic selection has not yet been adopted, it is recommended that semi-automatic operation should be introduced, whereby the operator of the originating international telex position receives the booking, set up and controls the call.

4.1.2 Where semi-automatic service is not possible, call shall be established manually by means of two or more international telex position in tandem whereby the operator of the originating international telex position normally receives the booking.

4.1.3 The number of circuits between two networks and the switching equipment should in all cases be calculated as far as possible for a no-delay telex service.

4.2 Setting Out the Message

After the exchange of answer backs, the calling subscriber can transmit his message for which the following uniform procedure is recommended:

- start a new line and mention own reference, if any, and date of dispatch
- start a new line and indicate the priority of the message, if desirable, such as URGENT, VERY URGENT, etc;
- start a new line and indicate if appropriate and/or the name of the person or department for whose attention the message is intended;
- start a new line and transmit the text of the message;
- after having completed the message, start a new line and transmit a plus sign (+) indicating the end of the message;

- obtain the answerback of the called subscriber, check it in order to be sure that the connection is still in good order and generate own answerback;
- if there are more messages they should be separated from each other by at least 8 line-feeds, after the exchange of answerbacks;
- after transmission of the last message and the exchange of the answerbacks send at least 8-line-feeds and give the clearing signals.

4.3 Telex Service Objective Standard

TELEX SERVICE

Obj. or Key Area of Concern	Long Term Obj. (10 yrs)	Short Term Obj. (5 yrs)
End User		
Quality of Service		
Reliability of Service		
Station Service		
Reliability	97 %	90 %
Circuit Reliability		
% Reliability		
Class A or UHF ccts	99.7 %	99.3 %
Class B or VHF ccts	99.6 %	99.2 %
Class C or HF ccts	96.7 %	93.4 %
MTBF		
Class A or UHF ccts	997.00 hrs	567.43 hrs
Class B or VHF ccts	1494.00 hrs	992.00 hrs
Class C or HF ccts	351.64 hrs	240.57 hrs
MTTR		
Class A or UHF ccts	3 hrs/outage	4 hrs/outage
Class B or VHF ccts	6 hrs/outage	8 hrs/outage
Class C or HF ccts	12 hrs/outage	17 hrs/outage

Grade of Service – Lost		
Calls	2/100 attempts-BH	5/100 attempts-BH
Billing accuracy		
complaints	1/100 bills/mo	5/100 bills/mo.
Response to complaints		
Aug.	80 % in 24 hrs	80% in 48 hrs
Outside Plant		
Reliability of Service		
Trouble rate	.05/cct/mo.	.10/cct/mo.

Note: Telex provided in large and medium size cities (Class A & B)

All public telecommunications carriers shall adhere to the service performance standards herein promulgated. All public telecommunications carriers shall submit to this Commission, quarterly reports as may be prescribed by the Commission of their service performance in compliance with the above set standards, prepared by and duly signed and sealed by a licensed Electronics and Communications Engineer (ECE) actually employed by the authorized public telecommunications carrier.

This Circular together with Attachment I and Annexes A to D, may be revised, revoked or amended, as the Commission deems fit in accordance with the law.

This Circular takes effect immediately.

Done this 15th day of October, 1990 Quezon City, Philippines.

JOSEFINA T. LICHAUCO
Acting Commissioner

FLORENTINO L. AMPIL
Deputy Commissioner

FIDELO Q. DUMLAO
Deputy Commissioner