

NETWORK TECHNICAL SUPPORT PLAN DESCRIPTION FOR THE BELL OPERATING COMPANIES

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CENTRAL SERVICES ORGANIZATION — PROPRIETARY

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(c) Joint and cooperative testing.

Revision arrows are used to emphasize the more significant changes.

1.03 The various and complex **network** services that are provided directly by the BOCs require that personnel have technical knowledge and understanding of various network equipments and facilities. These network personnel occasionally need assistance. Therefore, a technical support function has been described and designated. The designated NTS personnel, referred to as contacts, are responsible for expeditiously resolving complex installation and maintenance service problems. The NTS plan affords this assistance directly and quickly by providing a ready resource of Operations and Engineering NTS personnel.

1.04 The term **Network** as used in this section is defined as all equipment, facilities, and services between any network interface (NI) at customer premises at one end and (1) the NI at customer premises at the other end for intra-LATA services or (2) the BOC/IC demarcation or interface, called the point of interface (POI) at the ICs point of presence (POP), for inter-LATA services. The NI is defined as the location on the customer premises at which a **Network** service offering is terminated. Network channel terminating equipment (NCTE) may be required in order to properly terminate the network service in terms of design, installation, and maintenance. This NCTE will be provided by the **Network** and located on the **Network** side of the interface.

1.05 The NTS plan is intended to provide technical assistance to BOC network forces as rapidly as possible. It is expected that NTS contacts will be needed to help solve complex problems that normally require assistance and that result in excessive outage times and dissatisfaction. Although it may primarily involve services in the Special Services category, NTS is not limited to those services. All types of facilities or equipment may be involved. Official operator or internal services are included.

2. DESCRIPTION OF SUPPORT

2.01 The NTS contacts are a nucleus of personnel in the BOC **network** organization located at company headquarters and in each operating area in both Operations and Transmission Engineering. The primary responsibility of these contacts is to meet

service needs by assisting and supporting BOC network forces in performing complex tasks that are new or rarely encountered.

2.02 The primary objective of NTS is to improve **network** services by bringing **network** service problems to the attention of technical personnel through the use of escalation procedures. The use of these procedures can aid in reducing long service outages or delays which could cause acute customer dissatisfaction.

2.03 An initial step toward improving **network** services is to ensure that the network forces are properly trained and equipped to carry out basic work assignments. The NTS contact is in a position to recognize the need for more or improved test equipment/training for the respective groups to perform their normal tasks. Any deficiencies that are found should be referred to the proper departmental staff group.

2.04 The objectives and rationale of the NTS concept are:

- To provide timely, effective technical support to solve complex and/or time consuming problems experienced by users of **network** services.
- To verify NTS functions exist and are being performed today. Personnel performing these tasks have been identified and formally designated so that similar specialists in other areas know who to call.
- To provide personnel with an immediate NTS contact in all areas of the country. This contact needs to be technically trained, equipped, and responsible for helping to solve escalated technical service problems.
- To inform, train, and keep current a small group of specialists in the fast-changing technologies involved in new service offerings.
- To ensure that NTS contacts who may not be a "subject matter expert" in all areas of transmission, signaling, and switching know and can immediately call upon the experts in that field.

A. Organization

2.05 Operations is the organization that is measured to meet results criteria both for productivity and service quality. Engineering traditionally provides the design function and technical support for maintenance functions. Many situations could require that both organizations become involved. The escalation framework shown in Fig. 1 indicates coordinated effort when required. Dual escalation should be avoided.

2.06 A list of the NTS contacts in Operations and Engineering is published in Section 010-523-101. All initial requests for assistance from network forces or support groups will first go to Operations and then to Engineering for support when needed.

B. Availability and Staffing

2.07 The NTS contacts should not be so encumbered with other duties that they are not immediately available to the field for technical support activities. Resolving **network** technical problems arising from user reports should be the highest job function priority. Contacts in both Operations and Engineering organizations in each BOC area and company headquarters have been designated as the point of contact for that entity.

3. NTS PERSONNEL

3.01 This part describes the typical qualifications and responsibilities of NTS contacts.

A. Qualifications

3.02 In order to perform effectively, NTS contacts must have knowledge, experience, or understanding in the following fields:

- Methods of testing data and voice, analog and digital, private line, switched network, and private switched network services
- Central office switching equipment
- Signaling concepts
- Tariffed offerings
- Registration, interconnection, and interpositioning
- Satellite vs. terrestrial transmission effects

- All types of wire and radio carrier systems
- Test equipment and testing techniques
- The effect of station equipment, data set, and terminals on **network** service
- Practices, drawings, and technical references
- Network channel terminating equipment
- Central office transmission and signaling equipment
- Power and grounding.

3.03 In addition to these qualifications, the NTS contact should have a good appreciation for modulation theory, coding schemes, computer technology, and software support systems.

3.04 The NTS contacts will communicate with many work groups both inside and outside their regional company and the Central Services organization (CSO). They must have sufficient technical background to communicate effectively in these encounters.

B. Responsibilities

3.05 The primary function of NTS personnel is to assist in resolving unique problems on **network** services. All **network** services, customer or internal, will have equal importance to NTS personnel in terms of priority or type of assistance rendered. In response to a request for assistance, the contact will consult the Circuit Control Office involved to determine which tests have been made, analyze test results, and recommend solutions. These trouble solving activities may include all or some of the following responsibilities:

- On-site field assistance
- Methods counsel
- Policy counsel
- Informal on-the-job training of field forces during case resolution
- Monitoring quality of service to customers
- Monitoring test equipment needs.

On-Site Field Assistance

3.06 The NTS contacts will go to customer locations, IC locations, central offices, outside plant locations, and interoffice repeater locations as required to identify and cure unusual service problems related to **network** services. They are expected to coordinate their efforts with the normal network repair forces/work groups responsible for that equipment. They will coordinate their activities with other technical support personnel to obtain assistance at work locations outside their assigned territories.

Methods Counsel

3.07 The NTS contacts will offer advice on reasonable questions about service quality relating to Network services. These questions may originate from, or be directed to, the Network Test Center forces, sales forces, or other support groups. Some examples are:

- Network installation and maintenance forces via proper bureaus for technical advice or assistance
- Network report centers, such as Special Service Centers, Serving Test Centers, Switching Control Centers, etc
- Network Administrative Centers for technical assistance
- NTS contacts in other companies or areas for help on circuits, trunks, or facilities into that area
- Management or Sales on formal or informal customer complaints for customer notification or action
- Central or Regional staff as a contact on service matters
- A design engineer on a problem regarding design of a circuit or service
- A maintenance engineer regarding corrective action on equipment.

Policy Counsel

3.08 The NTS contact may be called upon to implement system policy regarding the Company's

obligation and responsibilities as outlined in tariffs, technical references, and maintenance practices. The NTS contacts, of course, do not make policy but will need to contact those people who do and to convert that policy into the actions required by work forces. Examples of this type consultation might involve interconnection, interpositioning, registration, etc. Terms, such as assembly, permissive, unsupported, etc, will require interpretation into specific criteria in order to avoid judgemental confrontations with customers. A specific example involves analog data service. The repair service obligation is defined at the digital interface, but the performance criteria for this service at the network or analog interface is much more difficult to administer because it involves a dozen or so transmission parameters.

On-The-Job Training

3.09 On-the-job training will be accomplished by the NTS contact working on-site, as well as by telephone, with field people to resolve difficult problems. This training function will occur and should be encouraged. However, the use of NTS personnel as formal trainers should be avoided.

Monitoring Quality of Service

3.10 While involved in the resolution of customer service problems, NTS contacts will have the on-going opportunity of observing the quality of service being provided to our customers. In this role, they are able to observe the overall effort being applied and to identify weak spots and areas where improvement in service quality is needed. Service order flow, proper installation work to avoid immediate repair visits, incomplete testing, and repeated "no trouble found" dispositions are examples of things to watch for.

Monitoring Test Equipment Needs

3.11 The NTS contact is also in an excellent position to recognize when there is a need for more or improved test equipment by the respective groups and to refer such deficiencies to the proper departmental staff group.

4. CASE ESCALATION

4.01 Formal and uniform escalation procedures are necessary to bring the proper resources to bear on **network** service problems. Complex prob-

lems encountered by the field forces, such as incompatibility between the station apparatus and the customer's method of operation or poor performance due to an unusual transmission impairment, often require expert assistance for a fast resolution of the problem. To improve the installation and maintenance of *network* services and to help avoid long service delays or outages and customer complaints, the field forces must be provided with rapid access to technical personnel who can assist in resolving these problems. It should be stressed that a request by field forces for on-site technical assistance does not relieve those normal forces of the responsibility of resolving the problem and/or logging the reports. It also does not relieve those normal forces of making normal operational and maintenance type tests before escalation. Coordination and the lack of proper test equipment is not a reason for escalation.

4.02 There are two basic kinds of escalation for *network* service problem cases: administrative and technical. The NTS contact should avoid involvement in administrative matters and concentrate on solving technical problems. These two types of escalation and the conditions under which they apply are outlined below.

A. Administrative Escalation

4.03 Administrative escalation is the normal organization technique for resolving problems that are fairly well defined in most companies. This procedure refers problem cases through the chain of command successively higher until a supervisory level is reached that can resolve the problems on an intra- or interdepartmental basis. This type of escalation is effective in dealing with administrative problems but is not always the most effective method of rapidly resolving difficult technical problems.

4.04 Examples of administrative matters are basic planning shortcomings, service order incompleteness, lateness or errors, design deficiencies, equipment or facility availability or known incompatibilities, shortage or recognized inadequacy of test equipment, incomplete testing, training deficiencies, business services needs, or difficulties in scheduling coordinated tests. It is extremely important that NTS contacts do not become involved in either resolving or escalating these administrative matters. Although it is sometimes difficult to separate administrative matters from technical service problems, every effort should be made to do so. However, a se-

ries of seemingly administrative matters can easily result in a technical problem—the overall service may involve many elements of facilities, such as equipment, switching, signaling, equalization, etc. Each is a simple matter in itself, but when integrated with others, the individual causes may not be identifiable. An example situation is where a particular modulation scheme is vulnerable to a particular transmission parameter. These cases can take excessive time to resolve if not spotted early.

B. Technical Escalation

4.05 Generically, there are four tiers of technical support that can be used as needed to resolve problems. The first tier is that provided by normal Network forces, whether in a Special Service Center (SSC), Serving Test Center (STC), Serving Control Center (SCC), NTEC, Facility Maintenance and Administration Center (FMAC), or Installation and Maintenance (I&M). The second tier is the assistance provided within that center, bureau, or group, whether it be by a more experienced technician, the foreman, or a designated "field assistance supervisor." The third tier of technical support is provided by area NTS contacts, by direct call to these contacts. The fourth and final tier is performed by NTS contacts, normally Headquarters or CSO, and entails involving the individual "subject matter expert" on the particular problem, whether that person is local, regional, or with the product supplier.

4.06 Escalation of technical problems must follow an entirely different path from administrative problems if the problems are to be resolved quickly. Simply stated, NTS must expeditiously define the problem and get to the person who knows the solution. Therefore, the escalation procedure for resolving technical problems is designed to find the most direct route to get help, as shown in Fig. 1 and 2. Each step in the escalation will afford a broader scope of contact until finally reaching the person that actually developed the device, system, or plan in question. The main purpose is expediency. If at any step the contact is unavailable, that step should be bypassed in order to get the answer quickly, with follow-up as appropriate.

4.07 *The first escalation step* is the most critical and also most difficult to enforce. The normal human attitude "just give me a little more time, I'll figure it out" can result in irritated or dissatisfied customers. When standard practices or other guide-

lines are followed, they can at best serve to resolve the vast majority of the problems that are encountered. The remainder results from conditions or situations that were not envisioned and must be resolved by perseverance, experience, or assistance. It is for these reasons that this phase of the escalation process must be made mandatory.

4.08 There are three general situations where the first phase of escalation of problem cases from normal work forces or centers to area NTS contacts is mandatory:

- Standard specifications are met but the customer is still not satisfied.
- Standard specifications cannot be met and the reason cannot be found and up to four working hours are allowed for determining the cause before escalation.
- The third repeated report has been received on the same service within a 30 day period and the first two reports were cleared as "no trouble found" (test ok, found ok, and came clear) after a visit to the premises by the BOC repair forces. (Local judgement to be utilized on other than special services.)

4.09 Most cases will be resolved at this first tier of escalation by telephone conversation. However, some cases will require on-site assistance to utilize the experience, training, or testing capability of NTS contacts. The training and test equipment required for this level of investigation would not be economically feasible for normal work forces. Training courses and regular updating seminars for new service offerings will be available to keep NTS contacts current.

4.10 *The second step* in the escalation process is to Company or Region Headquarters. At this level of escalation, the broader scope of experience in other areas and companies is brought to bear. On-site assistance by Headquarters NTS will seldom be required. A close contact with all area/region NTS contacts is required to assure that all avenues have been investigated and that experts in all fields have been consulted.

4.11 *The final step* of escalation is to the Central Services Organization of NTS where immediate contact with the person(s) that originated the

equipment or plan in question can be accomplished. Again, telephone conversation will be used almost entirely, with on-site visits as a last resort.

5. BOC WORKING RELATIONSHIPS

5.01 This part discusses some of the coordination aspects with other network groups involved with the NTS effort. These coordination procedures are intended to supplement, not replace, existing administrative and control office responsibilities and practices by efficiently bringing in the proper NTS assistance on complex technical problems.

5.02 There must be efficient coordination and cooperation among all the parties concerned with the provision of *network* services. This applies equally to both inter- and intracompany relationships. When more than one NTS contact is involved with a particular service problem, the NTS contact that resolves the problem should always provide feedback of the results to the other NTS contacts that have assisted. In this case, the NTS contact within the control office area/BOC will be the "lead NTS" to coordinate the efforts involved.

A. Operations and Engineering

5.03 The Operations and Engineering contacts for the NTS Plan will interface with each other regularly, maintaining a close working relationship. Certainly, both disciplines are involved. The NTS concept is Operations driven with the full support of Transmission Engineering. The need for technical assistance can result in a myriad of causes or events. The intent is for Operations NTS to (1) assure that maximum use is being made of existing centers, functions, practices, and capabilities, (2) resolve complex cases utilizing available resources, and (3) request support on those technical cases that truly require Transmission Engineering assistance.

5.04 It is expected that a high percentage of cases will be handled by telephone, with on-site assistance provided only as required. This on-site assistance can be provided by either or both specialists depending upon the availability of proper test equipment, expertise, and the preference of the specialists. However, requests for technical assistance should be met immediately.

5.05 If the field escalates a case directly to the NTS engineer, the engineer should contact the ap-

appropriate NTS Operations personnel to be sure they are aware that technical support has been requested.

5.06 If the Operations step is bypassed because the contact is unavailable, the Engineering contact should attempt to correct the problem as quickly as possible and make the appropriate follow-up calls to Operations later for Case Summary reporting.

B. NTS Interfaces with Network Centers/Groups

5.07 The NTS contacts are designated primarily to assist their company network centers and groups. When these centers or groups request technical assistance, it should be considered as the primary mission of NTS. It is important to stress that NTS does not replace or supplant any existing functions but is intended to help in those cases that go beyond the normal practices or require special testing or expertise.

5.08 Over the years, specific coordinators or functions have been identified, such as Data Specialist, Digital Data System (DDS) Coordinator, Other Common Carrier (OCC) Contact, Common Channels Switching Arrangements (CCSA) Coordinator, Signaling Contact, etc. The NTS contact can act as a source of information for these functions and help to avoid repetition or duplication of efforts. The NTS function is intended to provide technical support and will not replace or duplicate these other functions. The NTS contact knows who to go to for help in a particular discipline or responsibility.

C. NTS/Service Manager and NTS/Marketing

5.09 The NTS would normally not expect to receive trouble reports that have not been reported to a Repair Bureau/Center (Special Service Center, Serving Bureau, Serving Test Center, Repair Serving Bureau, etc). When such reports are received, they should be referred to the report center to be handled in the normal manner. These interfaces are covered in Part 6.

6. NTS/INTERFACES WITH OTHER ENTITIES

A. General Purpose

6.01 ♦The purpose of these guidelines is to provide a common approach in dealing with IC and CPE suppliers (other entities) on cases that are referred in/out. These guidelines are not intended to

supplement or replace the functions presently performed by the Bell Point Of Contact (BPOC) or Engineering Point Of Contact (EPOC) personnel. It is important that, even when cases are referred from/to outside entities, the normal trouble reporting process must not be bypassed. The first step in investigating these cases will be to determine that normal BOC Network forces have had a reasonable opportunity to resolve the problem before beginning an NTS investigation. There will also be occasions when technical support contacts in the outside entities will want to discuss technical matters with BOC NTS contacts.

6.02 Figure 3 shows that the responsibility for overall customer service is divided among separate forces. The figure is intended to be general and apply for both switched and dedicated services. The network interface is that point on the customer premises, between the network channel terminating equipment and the customer premises equipment, where the BOC provided network access line terminates. The point of interface is that specific point in the point of presence on an inter LATA circuit where BOC access tariff compliance can be verified.

6.03 Where services within a LATA (intra-LATA) are provided solely by a BOC (NI-NI), the only entity interaction will be with CPE suppliers or the customer agent. However, intra-LATA and inter-LATA services provided by ICs will always include the interaction with an IC and a CPE supplier. Although the BOC responsibility is to assure tariff compliance from NI to POI, customer service integrity must be preserved. The BOC's customer (may be the IC) has the end-to-end (NI-NI) responsibility on inter-LATA services and intra-LATA services provided by an IC.

6.04 The BOC Network forces will normally conduct tests and activities with minimal interfacing with forces of other entities. However, there will be many instances when each segment of the service meets specifications but overall service requirements for customers are not satisfied. In these instances it is anticipated that NTS will be involved. In meeting this need, NTS contacts must observe the legal constraints as covered later; assure that normal procedures are being followed, including tariffed billing arrangements; and verify that obligations to customer service needs are being met.

B. Escalation from/to Outside Entities

6.05 There will be instances when communication will be necessary for from/to BOC NTS con-

tacts and technical support contacts with ICs and CPE suppliers. During the trouble clearing process, regular work forces may have interfaced with the technical support contacts of other entities. However, there should be some control over the amount of this interaction and the exchange of information. There must be assurance that legal constraints are being met, observing the changing environment, and that all guidelines for entity interaction are being followed. The escalation hierarchy for resolving problem cases involving outside entities is shown in Fig. 4. Although there will be contacts for information purposes, when an escalated trouble case is involved, the first step must be to assure that normal trouble reporting processes have been followed.

6.06 After the first contact on each case, the case will be referred to area NTS for resolution. At this point there may need to be direct interaction with the technical support contact in the referring entity, or with another outside entity. For example, the first request for assistance may come from a CPE supplier, but the BOC area NTS may need to interface with an IC to verify overall service integrity. If this situation occurs, it would be advisable to establish this contact through the approved BOC/IC contact (BPOC, EPOC).

7. EXCHANGE OF TECHNICAL INFORMATION—LEGAL CONSTRAINTS

7.01 It will be necessary for BOC NTSs to exchange technical information with technical support groups associated with outside entities. For example, each will need to know the amount of loss, noise, jitter, etc, being measured at a location or access point in order to isolate the cause of problems with the service. However, this exchange should only include that information relating to the trouble. As a rule, the exchange of technical information should be limited to that information specified in tariffs and needed to resolve the problem.

7.02 Legal constraints that must be observed are (1) safeguarding proprietary information, (2) protecting customer information, and (3) avoiding comparing the equipment or services of one supplier or carrier with that of another. The NTS contacts must also be familiar with the legal advice contained in the following booklets:

- Bell System Competition Guidelines—dated November 1981
- Bell System competition Guidelines—MFJ Supplement—dated January 1983.

While following these guidelines and meeting a personal commitment to the Company's Code of Conduct, customer service needs must be met.

7.03 Examples of information that should *not* be provided are listed below:

(a) BOC Network Proprietary Information.

- Unpublished details of network design, interfaces, or standards
- Construction plans
- Descriptions of new network services, capabilities, modifications, operations, costs, features, performance characteristics, or objectives.

(b) Customer Proprietary Information

- The kinds and quantities of service a customer has
- The locations or termination points of a customer's service
- Traffic and usage data
- Changes in a customer's service
- Changes billed to a customer or an account
- Derived information (such as analysis or studies).

(c) Joint Marketing Information

- Recommendations of products, services, or supplies
- Comments on the quality, capability, or performance of a supplier and its products, services, or supplies
- Participation in meetings or discussions about the sale of offerings except at the customer's request
- Countersigning or endorsing proposals
- Forwarding sales leads to a supplier's personnel
- Distributing or referring sales literature.

8. JOINT AND COOPERATIVE TESTING

8.01 During the investigation of escalated cases, it may be necessary to work with outside technical support contacts, either while performing tests at the same interface location or with each other at separate locations. The results of these measurements must be shared and discussed. As conclusions are made, corrective action or more exhaustive tests may be required. Overcompensation of any segment of a service rather than correcting another should be avoided. The BOC should assure that its own service responsibilities have been met.

8.02 The ancillary service provisions of the BOC tariff may contain statements, including charges, governing joint/cooperative testing with ICs or CPE suppliers. The NTS contacts should determine if tariff charges apply and assure that the customer and the ICs/CPE suppliers are advised in advance of any charges that are billable.

Note: *Should overall cooperative testing be required, it is the responsibility of the customer, or the provider of the telecommunications system acting as his agent, to arrange for and coordinate the specific tests to be performed.*

8.03 The BOC NTS and IC/CPE technical support contacts should have access to technical references, tariff specifications, circuit information defining PCI, performance criteria, and tariffed limits. In addition it will often be necessary to exchange additional nonproprietary technical information to jointly resolve difficult problems. This may include circuit component details, internal electrical measurements, and other information necessary for a full understanding of the problem by all companies involved. **The BOC NTS personnel must make certain that all ICs and CPE suppliers are treated equally.** Similar procedures should be followed for all companies in sharing technical information during problem resolution. Circuit details of facilities provided by the BOC to one carrier should not be discussed with other carriers.

9. CASE DEFINITION AND REPORTS

9.01 The NTS will become involved in many and varied activities and can receive requests for help that range from simple tasks to the investigation of large complex networks. For the purpose of

record keeping, it is necessary to provide some guidelines for defining an NTS case. In most cases, the request for assistance will involve a single circuit, channel, or service. However, when investigating a complaint on a customer's total service or a complex private network, for example, it may be concluded that a number of different problems need to be investigated separately, resulting in individual cases. At the same time it is important that the case tally not be "clouded" with a large number of cases that each require a few minutes of time and effort. Therefore, the following guidelines will be used in defining an NTS case:

- (a) Any request for help following mandatory escalation rules, such as:
 - (1) Meets standards/tariff requirements but customer is not satisfied
 - (2) Does not meet standard requirements, but the trouble cannot be identified and more than normal time and effort has been expended
 - (3) The third trouble report has been received on the same service in a 30-day period and the first two reports were cleared as "no trouble found" (test ok, found ok, and came clear) and a visit to the premises has been made by the BOC repair forces. (Local judgement to be utilized on other than special services.)
- (b) Any escalation that requires a customer premises visit by NTS
- (c) Any escalation due to a formal complaint
- (d) Consultation exceeding 10 minutes involving a customer service
- (e) Request for advice or assistance on a customer service that requires research and call back
- (f) Questions involving test equipment or methods, policy, requirements or training that are time consuming and considered important to the maintenance of customer services.

Even with these guidelines, it will be necessary to exercise judgment in determining caseload. The local log may be used to retain information that may, or may not, represent an NTS case.

9.02 Monthly reports are to be prepared by each company contact as an analysis tool for deter-

mining causes of problems. These reports will aid in quantifying the level of activity performed by NTS personnel. These reports should be forwarded to the Headquarters Operations contact by the tenth working day of the month for the pervious months activities. These reports consist of the case report and the case summary. Examples of these reports are shown in Fig. 5 and 6, respectively.

10. NTS TRAINING

10.01 There are formal NTS training courses available at the Bell System Center for Technical Education (BSCTE) at Lisle, Illinois. These courses consist of the following:

(1) Data

- Data, Services Network (DSC-Network)—A 2-week course that covers transmission impairments on the network that affect data transmission.
- Data Services, Teleprocessing (DS-TP)—A 2-week course that covers teleprocessing protocols such as X.25 packet switching and SNA.
- Data Services, Terminal Equipment (DS-TERMS)—A 2-week course that covers

the testing of various terminal equipment such as data sets and terminals.

- Data Services, Digital Data System Maintenance—A 2-week course that provides management personnel with the skills and knowledge needed to technically support the Digital Data System (DDS).

(2) Voice

- Voice Technology (VOITEC)—A 2-week course that covers transmissions and signaling impairments on the network that affect voice transmission.
- Trouble Analysis of Transmission and Signaling (TATS)—A 2-week course that covers transmission and signaling analysis on all voiceband channels on the network, with special emphasis on Special Services.

In addition, various courses that are technology specific (ie, Analog Transmission Systems, Digital Transmission Systems, Switching System, etc) are available and may be appropriate, depending on individual needs.♦

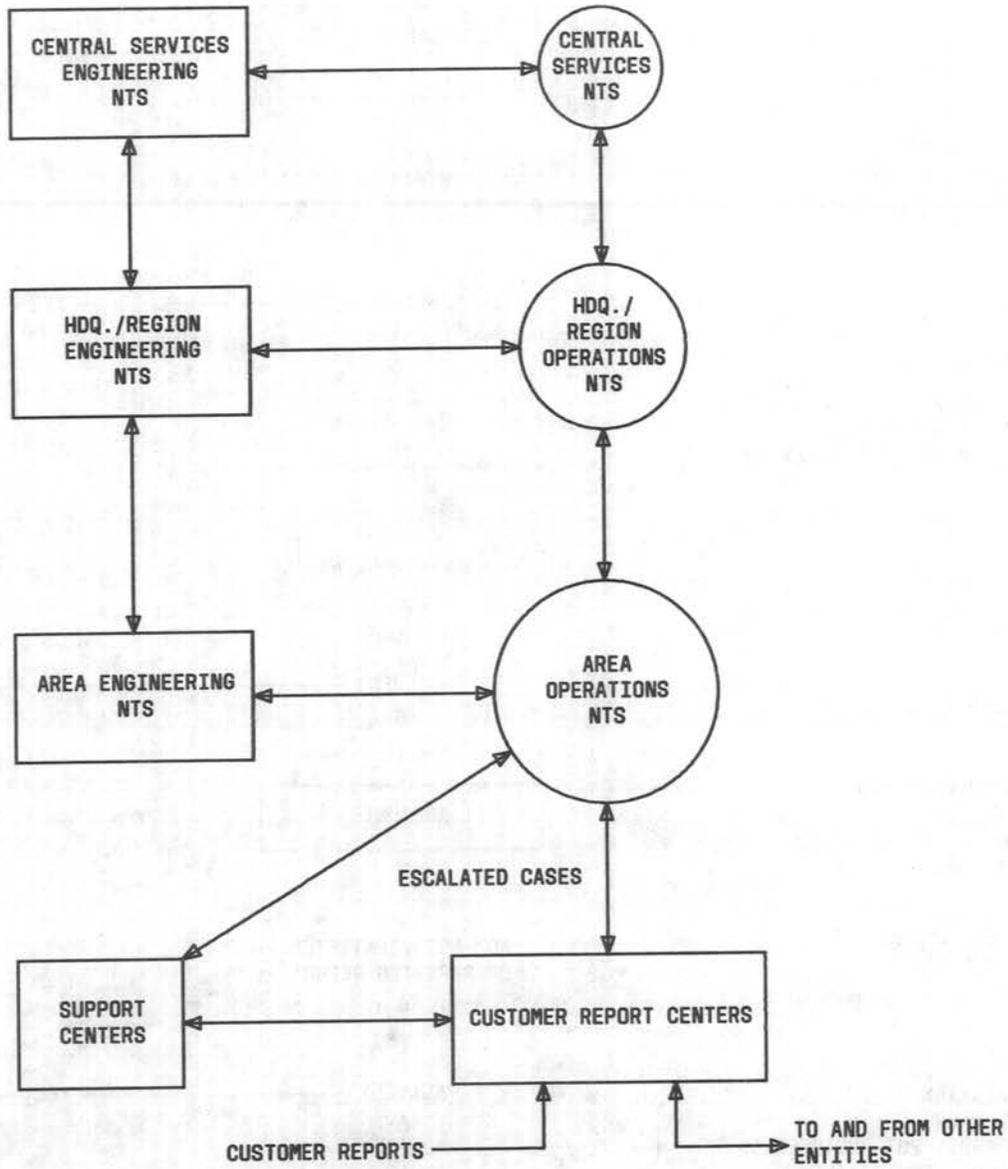


Fig. 1—Flowchart of Network Technical Support Escalation

AVAILABLE FOR SUPPORT AND ASSISTANCE BY TELEPHONE BY "ORIGINATOR" AS NEEDED

AVAILABLE FOR SUPPORT AND ASSISTANCE BY TELEPHONE FOR INTERREGION OR INTERCOMPANY MATTERS

AVAILABLE FOR SUPPORT AND ASSISTANCE:
 - BY TELEPHONE
 - ON-SITE AS NEEDED

MANDATORY ESCALATION FOR ASSISTANCE WHEN:
 1. MEETS STANDARDS, BUT CUSTOMER IS NOT SATISFIED - IMMEDIATELY
 2. DOES NOT MEET STANDARDS - 4 HOURS TO FIND REASON, THEN IMMEDIATELY
 3. THIRD REPORT IN 30 DAYS - IMMEDIATELY

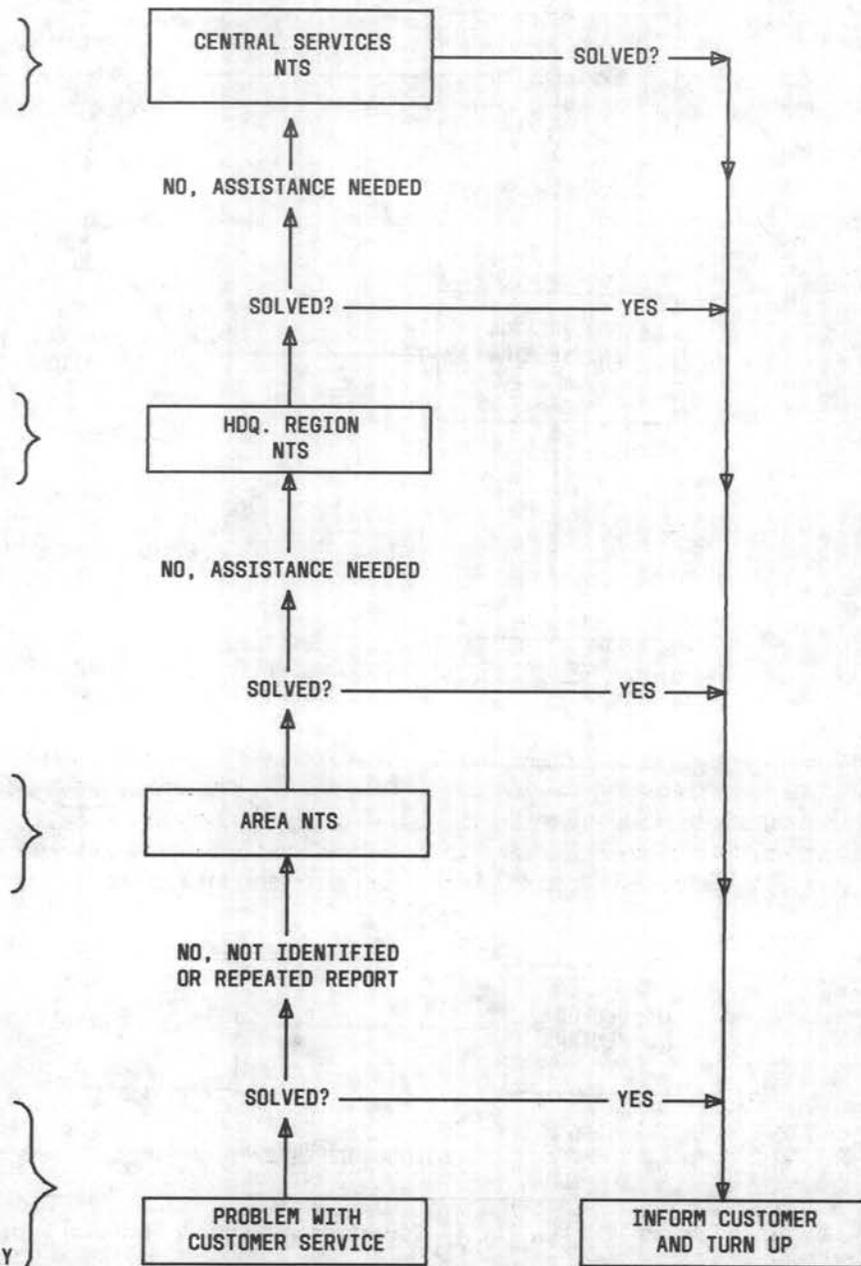
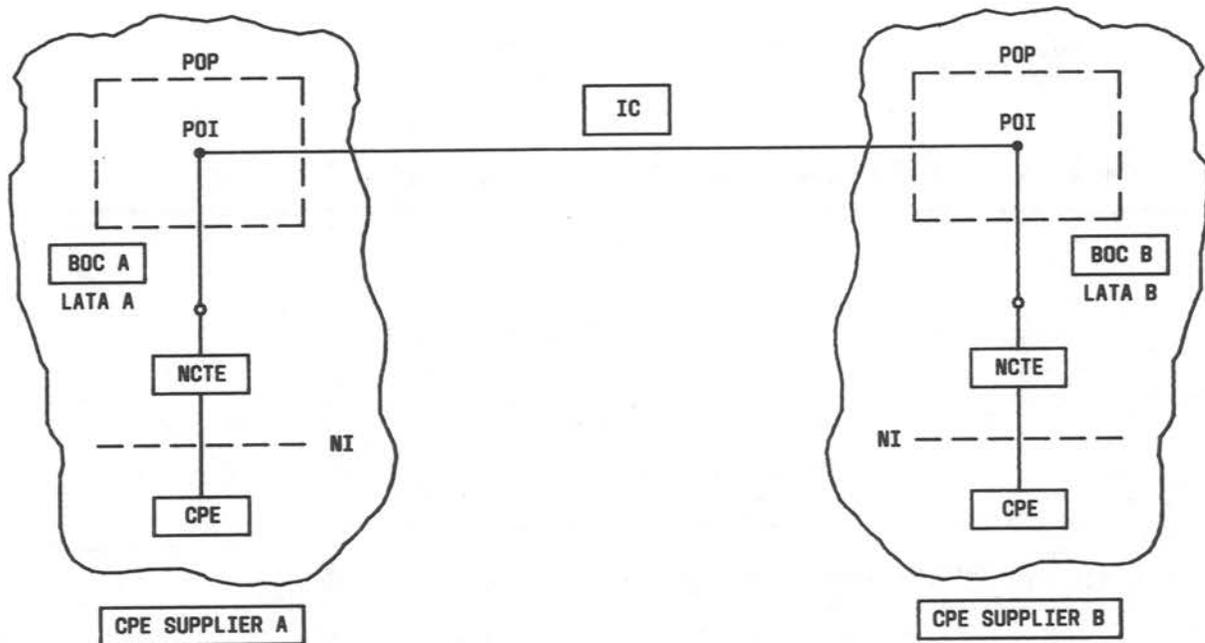


Fig. 2—Escalation Flowchart



LEGEND:

- BOC A, B - BELL OPERATING COMPANY A AND B
- IC - INTEREXCHANGE (INTERLATA) CARRIER
- CPE SUPPLIER - A, B - CUSTOMER PREMISES EQUIPMENT SUPPLIER A AND B
- CPE - CUSTOMER PREMISES EQUIPMENT
- NI - NETWORK INTERFACE (AT CUSTOMER PREMISES)
- NCTE - NETWORK CHANNEL TERMINATING EQUIPMENT (AT CUSTOMERS PREMISES)
- POI - POINT OF INTERFACE
- POP - POINT OF PRESENCE
- LATA - LOCAL ACCESS TRANSPORT AREA

Fig. 3—Divisions of Responsibility for Customer Service

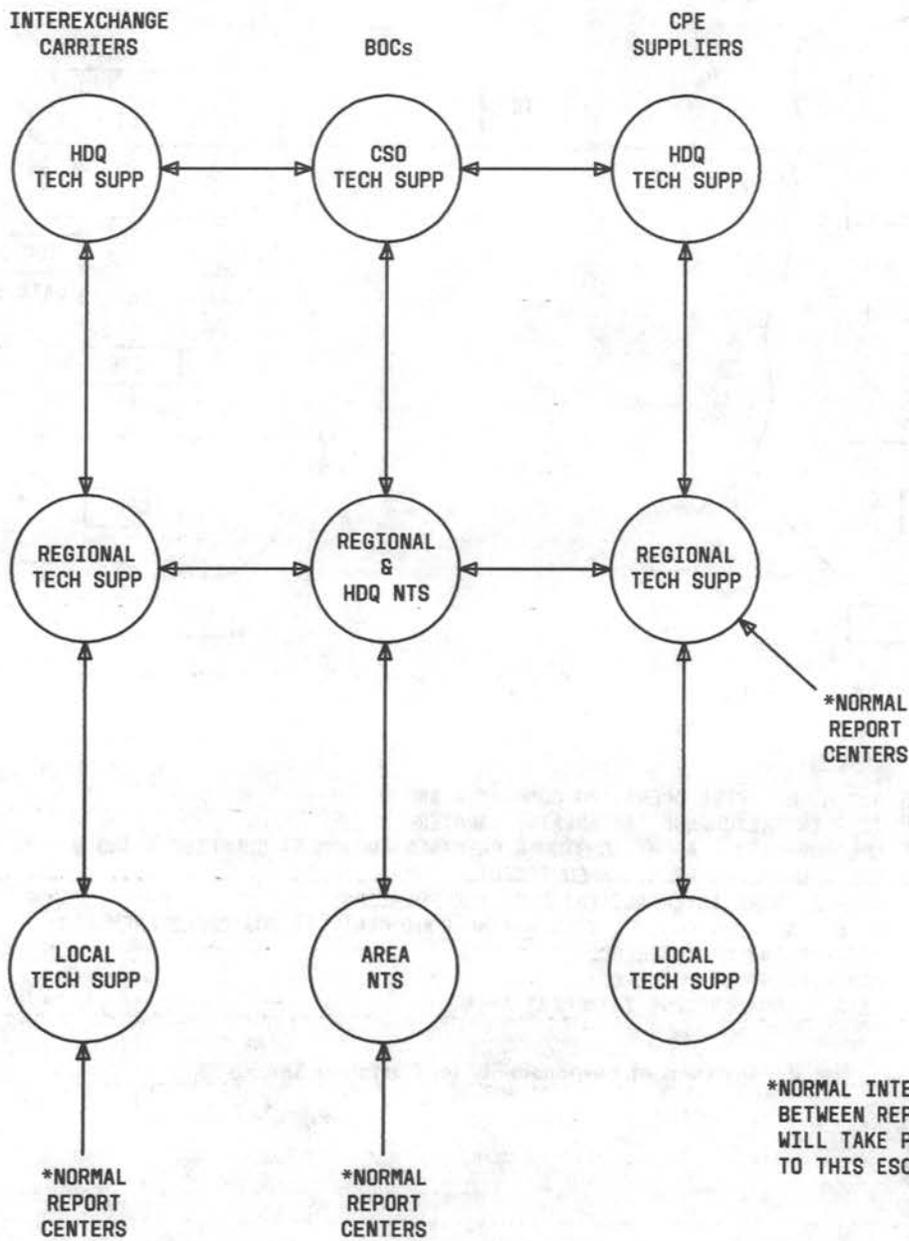


Fig. 4—Divested Environment Escalation Hierarchy

Bell Companies

Network Technical Support Case Summary

BS-1286
(2-82)

	Prepared By	Date
Company	Area	Month
Category	No. Cases	
Carrier, Long Haul		
Carrier, Short Haul		
Cable		
Switching Equipment		
C.O. Equipment (Term & Sig)		
Network Channel Terminating Equipment		
Customer Prem. Equipment (Non-Network)		
Customer Related		
Design Or Service Order		
BSP, TOP Or Operating Plan		
Test Equipment Or Testing Methods		
Training, Policy Or Procedures		
Other		
Total ◆		

SEND TO
 AT&T CO.
 NETWORK TECHNICAL SUPPORT
 295 NO. MAPLE AVE. RM. 2329F3
 BASKING RIDGE, NJ 07920

Fig. 6—Example of Case Summary Report