

**SWITCHING SYSTEMS MANAGEMENT**  
**NO. 2 ELECTRONIC SWITCHING SYSTEM**  
**NETWORK ADMINISTRATION MEASUREMENTS**

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**1. GENERAL**

**PURPOSE**

**1.01** The purpose of the network administration and maintenance measurement program is to measure, assemble, and output statistical data needed to engineer, maintain, and evaluate a No. 2 Electronic Switching System (ESS) central office. The program performs usage, peg count, and overflow measurements on all traffic-dependent items in the office, measures dial tone grade of service, tests for traffic overload conditions, outputs collected data on a scheduled or immediate demand basis, and processes traffic input messages. This section explains the network administrator's role in the acquisition, analysis, and dissemination of this data.

**1.02** This section is reissued to update and correct Part 2, Data Requirements and delete Table A, Validation Checks.

**2. DATA REQUIREMENTS**

**2.01** Depending on the operating telephone company organization, the kinds and amount of data each functional group requires will depend on the particular group's needs. For example:

(a) the network administrator will monitor key items of data in order to assess customer service and the result of administrative policies on equipment utilization.

(b) The network design engineers (traffic engineers) need data to size and provide additional equipment for office growth. (In cooperation with the network administrators, they will concur in the selection of the busy season months and busy hours in which data will be collected for them.)

(c) The trunk forecasters and trunk administrators (if they are a separate group) will need data for trunk groups to provide adequate trunking for the office on a long range as well as short range basis.

(d) Business services groups and marketing personnel will be interested in private branch exchange (PBX) and centrex customer group data to ensure that business customers have adequate equipment.

(e) The division of revenue groups, periodically, will require data studies in order to apportion revenues among the companies with whom each operating telephone company has connecting facilities.

(f) Special management reports are required occasionally in order to assess certain aspects

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of the switching system, such as residential cost studies.

### DATA STUDIES

**2.02** In order to provide the required data, preliminary studies must be made to determine the various busy hours and the busy season. Busy hour and busy season data are the most useful data for engineering and administrative purposes. These busy hours and the busy season will be selected by the network administrator with the concurrence of the network design (traffic) engineer. Busy hour determination studies are discussed in Dial Facilities Management Practices Division E, Section 2b, Busy Hour Determination, and Section 2c, Busy Season Determination.

**2.03** Once the No. 2 ESS is in an operating mode and has stabilized, the busy hours (originating plus incoming calls and network) need to be determined. These busy hours should not be changed during the year. When a new office is established, it is recommended that busy hour data be collected every month for the first year in order to establish the busy season. If the studied busy hour (or hours) is suspect, a new study should be scheduled for as many hours and days as is deemed necessary to verify the established busy hour (or hours).

**2.04** The No. 2 ESS busy hour studies are generally divided into three distinct categories:

- (a) O+I call busy hour during which the central processor is most heavily loaded
- (b) Network usage busy hour
- (c) Certain hardware and software equipment component busy hours.

**2.05** The central processor is real time limited in its ability to process calls. The approximate percentage of real time available to process calls is registered on the Q14 registers multiplied by one hundred in the LO-1 and EF-1 programs and the total of four Q14's is registered on the OFT 54 register in the EF-1 program procedure. The central processor capacity determination and all the necessary information for this determination is discussed in Traffic Facilities Practice, Division D, Section 12f(5), Call Processing Capacity—Post Cutover. A Call Capacity Determination (CADET)

program, with the attendant lessons, is a subsystem of the Program for Administrative Traffic Reports On Line (PATROL), and is available for operating telephone company use.

**2.06** The network usage busy hour determination is based on the total junctor (circuit plus wire) usage. This busy hour is referred to as the office busy hour. The service indicators busy hour is based on the highest percentage of loss, ie, dial tone delays, matching loss. Usually the office busy hour and the service indicators busy hour are the same. If there is a difference in the office busy hour and the service indicators busy hour, then an investigation should be conducted by the network administrator to determine the difference. If the investigation provides valid reasons for the difference in busy hour it should be documented. If the investigation reveals any discrepancies in the data then a new busy hour study should be conducted to correct these discrepancies.

**2.07** Certain engineered hardware and software components will have their own busy hours. Most of these will occur in the network usage (office) busy hour; however, component busy hours will occasionally occur outside the network usage busy hour. Coin control, for example, usually has a different busy hour from the office hour. Coin control busy hour is normally around 12:00 to 1:00 p.m. while the office busy hour is usually from 7:00 p.m. to 8:00 p.m. or 7:30 p.m. to 8:30 p.m. It will be the responsibility of the network administrator to report actual busy hour data for these components or to determine a busy hour ratio based on the component usage in the network usage busy hour.

**2.08** In addition to the above network administrative functions, administrative studies will be required for trunk groups, custom calling services, hundred call seconds (CCS) per class of service studies, load balance, junctor balance among networks, and other studies indicated by type of service provided.

### SCHEDULING

**2.09** Once the hours of study have been determined, the network administrator will be responsible for input of the Traffic Work Table (TWT) into translations. The TWT and associated messages are discussed in the Translation Guide (TG-2H), Division 4, Preparation of Forms. The traffic

measurement schedules are discussed in the Translation Guide (TG-2H), Division 10, Traffic Measurements, and in Section 232-120-301, Traffic and Plant Measurements.

#### DATA OUTPUT

**2.10** Data are stored in data accumulators or registers in call store. At scheduled intervals, specified on the TWT, the measurement information may be typed via the administrative teletypewriter circuit on tape and/or hardcopy or to the Engineering and Administration Data Acquisition System (EADAS). EADAS is an integral part of the Total Network Data System (TNDS) which is designed to satisfy requirements for the acquisition, analysis, and management of all types of data. The registers are zeroed as they are printed. EADAS magnetic tape output may be transferred via TDAS and T-TRAN to PATROL; this method is a time saver for the network administrator.

#### MEASUREMENT PROBLEMS

**2.11** If the call store area in which traffic measurements are stored should be lost because of transient clear, stable clear, or recent change clear initializations, the network administrator is made aware of the loss of data through an output message on the traffic teletypewriter as discussed in Dial Facilities Management Practices, Division H, Section 10d(4), Service Overloads and Interrupts, and in Section 10d(6), System Initialization Procedures. In every case, the TWT will be updated from the program store copy. Therefore, the network administrator must input into recent change any changes which may have been made to the program store copy of the TWT.

**2.12** Some validation checks are made within PATROL. A complete list of validation checks and limits will be made available when they are finalized.