QUALITY REVIEW PLAN

FOR

TRUNKS AND TOLL SPECIAL SERVICES

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1. GENERAL

OUTLINE OF PLAN

1.01 This Plan provides procedures to evaluate the quality aspects of Trunk and Special Service maintenance administration. It applies to all offices responsible for Trunking and Special Services, including the maintenance of central office equipment, signaling, carrier, and radio facilities. It replaces the Management Quality Control Plan for Toll Terminal and Toll Test offices dated January 1964.

1.02 Whenever this section is reissued, the reason for reissue will be listed in this paragraph.

PRINCIPAL FEATURES OF THE PLAN

1.03 Part 2 contains an explanation of the methods employed in the evaluation and the procedures for summarization of recent results data for analysis prior to the evaluation.

1.04 Part 3 describes evaluation procedures to determine:

(a) The degree of adherence to approved practices and policies

(b) The effectiveness of the office administration.

1.05 Part 4 provides for a post-evaluation review meeting and for a report of the evaluation results.

1.06 Trunking and Special Service testboards, distributing frames, signaling systems, transmission systems, repeater stations, radio relay stations, and associated power equipment ***are*** included in this Plan.

1.07 Power equipment and distribution frames maintained by other forces, ie, switching forces, are not included in this Plan. A detailed evaluation of these items is contained in Parts 4 and 5, respectively, of the Management Quality Control Plan for Switching Systems.

APPLICATION AND USE OF RESULTS

1.08 Evaluation results may be used by appropriate levels of management to identify:

(a) The quality of trunk and special service maintenance, both technical and administrative

(b) The quality of service provided, including reasons for known or suspected unsatisfactory conditions

(c) Force efficiency and administration

(d) The need for policy changes.

1.09 The overall view gained in this relatively short study should permit a decision to be made that either:

(a) No specific action is needed at this time.

(b) Certain actions are indicated and should be taken without further evaluation.

(c) Further study of the office is required to determine the extent of problems indicated by the initial survey and the total corrective program necessary.

ORDERING INFORMATION

1.10 The forms used in this Plan must be ordered through the Western Electric Company (WE) distributing house in accordance with local procedures. The requisitions should specify quantities equal to the minimum standard packaging or multiples thereof. Orders should be worded as follows:

(Quantity) Form (No.)

Standard packaging is as follows:

FORM NO.	PACKAGED
E-4979 (TA-TD) (Power Evaluation)	50 sets of 4 sheets to a package
E-4979-4 (TA-TD) (Frame Evaluation)	50 sets of 4 sheets to a package
E-5124 - 1 and -2 (Performance Indicators)	50 sets of 2 pages to a package
E-5125 - 1 through -9 (Administrative Evaluation)	25 sets of 9 pages to a package
E-5126 (Evaluation Summary)	50 sets of 2 pages to a package
E-6984 - 1 through -5 (Special Verification Items Digital Transmission Systems)	25 sets of 5 pages to a package
E-6985 (Span Line Test Record)	50 pages to a package
E-6986 (Carrier Option Work Sheet)	50 pages to a package
E-6987 (Repeater Bay Work Sheet)	50 pages to a package

1.11 The Checking Lists for Trunks and Special Services Power Equipment Evaluation, Distributing Frame Evaluation, and Special Verification Items are a part of this Plan and are described in Part 3.

1.12 The basic checking lists in the "Special Verification Items" section will be updated periodically and may be expanded by the local company headquarters in response to special local situations.

2. GENERAL INSTRUCTIONS

2.01 This Plan is a method for evaluating the quality of trunk and special service work and related equipment performance to determine the degree of adherence to approved policies and practices and the effectiveness of office administration. While the amount of these activities may vary between offices, the ***standard*** or ***goals*** are equally applicable and the evaluator need only tailor his investigations to the scope of the operations being appraised.

2.02 The evaluation procedures include:

- Message Trunking—including interlocal, toll connecting, intertoll, international, end office toll, and miscellaneous
- Special Services—including telephone, telegraph, program, television, data, SSN, CCSA, and WATS
- Carrier Systems—both analog and digital
- Facilities Systems—including cable, coax and radio
- Terminal and Repeater Equipment
- Transmission and Signaling Equipment

- Related Maintenance Support Systems—testboards, test frames, test positions, test lines, test sets, maintenance systems, ie, TFMS/OTTS, CTMS, etc, alarm and order-wire systems, etc
- Related Distributing Frames
- Related Power Plants
- Safety, Buildings, and Housekeeping
- Personnel Development and Training.

2.03 A 3-step method is employed to evaluate and report results:

(a) Gathering of data for the use of the evaluator prior to visiting the central office

(b) Evaluation made at the central office using an outline provided in the Plan

(c) Post-evaluation review meeting with local and District management and preparation of a summary report.

PRELIMINARY PROCEDURE

2.04 Prior to the evaluation visit to the central office, the evaluator must obtain copies of service and cost reports for the last six months. This should include Trunk Transmission Results, Trunk Outage Results, Special Service Results, productivity and cost data including overtime rate and any other appropriate indicators. Any data not available at headquarters should be obtained prior to the evaluator's visit to the central office. These data may be summarized on Form E-5124-1 and Form E-5124-2.

2.05 The evaluator should have the service and cost data early enough to allow him to become thoroughly familiar with it prior to his visit to the central office. He should review the data for trends as well as for current performance. Careful analysis of these indicators may suggest areas for detailed review during the evaluation. The evaluator should be prepared to discuss these indicators with the supervisor during the evaluation review meeting, and again during the post-evaluation review meeting.

2.06 If the evaluator is not familiar with the organization of the central office to be visited, he should obtain this information, including supervisory responsibilities and experience, ***prior to his visit.***

EVALUATION

2.07 The procedure for the evaluation is contained in Part 3 of the Plan. It is composed of over one hundred questions. The questions are based upon policies and procedures defined in Standard Bell System Management Plans, General Letters, and in BSPs. ***The key questions are designed to identify specific items and areas of substandard performance for higher management; therefore, no "coverup" numerical rating scores are used.*** The questions pertaining to service results and productivity/costs are to have greater emphasis placed upon them than those questions relating to effort (forms filled out, etc). ***However, questions pertaining to audit deviations must be given the most critical emphasis of all since it is expected that there should be no deviations, and the penalty for deviations should be significant.*** The evaluator will use his judgment in answering the question; however, only two categories are allowed, satisfactory or exception item, for each question.

2.08 By dividing the evaluation into many specific items, the evaluation will have less chance of subjective error. This method will also promote uniformity as to specific items to be evaluated and the identification of specific items in the overall evaluation that have substandard results. Local experience may suggest the addition of items to this outline. Such additions should be carefully considered, particularly if they increase the time required for the evaluation.

2.09 The checking lists for Central Office evaluation listed below provide a method for recording the evaluator's findings.

Forms E-5125 (Trunks and Special Services), E-4979-4 (Distributing Frame), E-4979 (Power Equipment Review), and E-6984 (Special Verification Items—Digital Transmission Systems). These forms list the key questions the evaluator will use and the findings associated with the question. The evaluator should circle or check the applicable indicator provided under the Satisfactory or Exception Item columns and should provide a brief description of the Exception Item in the space provided following the last item of each section for writing comments

on Exception Items noted in that section. If an item does not apply—write ***NA*** (Not Applicable) in the Satisfactory column.

2.10 This Plan is designed for use by local management or by a Company on a scheduled basis, in which case evaluations may be made by evaluators on the Company or Area Staff. Local management personnel can use this Plan to determine if the Standard System Management Plans are implemented, are used properly, and are producing satisfactory results. When Company or Area Staff evaluations are made, ***the evaluator must be thoroughly competent in both technical and administrative aspects of central office operations*** if he is to make accurate evaluations. ***This point cannot be overemphasized and if it is not given proper consideration, deficiencies and service problems may not be revealed.***

2.11 In particular, the evaluator must understand the principles of the Plant Management Instructions (PMI), Controlled Maintenance Plan (CM), Frame Administration Plan (FAP), and Plant Cost Results Plan (PCRP) and fully support these principles and be able to show how performance objectives can be attained using PMI, CM, FAP, and PCRP.

2.12 The decisions of the evaluator must be impartial and consistent in reporting conditions as they are actually found. Interpretations of approved practices must be based on good judgment. If more than one evaluator is designated by a Company or Area, it is important to assure that they apply uniform standards and have a common understanding of the objectives and policies relating to the Trunk and Special Service Job.

2.13 The questions in the outline are intended to indicate what is to be evaluated, rather than to limit the scope of the evaluation. The evaluator should keep alert for additional items which may suggest profitable avenues to follow or which may have a bearing on conditions previously or subsequently determined. For example, observing frame personnel working without proper regard for protection of nearby working circuits may suggest looking at circuit or service order work recently completed by these frame personnel. Similarly, a passing comment that the high frame load demands other craft people part-time might prompt further questions and a check for proper charging of work time and forecasting.

2.14 The evaluator should be interested in strengths as well as weaknesses. Seeing a unique method of handling a problem should prompt questions sufficient to judge the possibilities for wider use of the idea.

2.15 The evaluation procedure provides indicators of group or office performance. If, however, the study of performance indicators reveals a specific result not meeting objectives, or if a question reveals poor performance of a system, route or type of equipment, it should receive special attention. This might include examination of the complete routine record—intervals, results, conclusions. The evaluator must identify:

- Is the supervisor aware of the standard practices (CM, PMI, etc)?
- Is the supervisor aware of the problem?
- What has been done? What is planned?
- Is help needed? Has it been requested?

2.16 While separate sections are provided on the checking lists for topics such as safety, security, housekeeping, buildings, and supplies, it is intended that the evaluator note deficiencies as they are encountered rather than waiting to make a separate tour of the building to evaluate these items. For example, as the evaluator proceeds through the office, check the date of the last inspection of fire extinguishers, judge housekeeping, and note any safety hazards. Comments should be summarized in the appropriate sections of the summary form, bringing together all comments on a topic.

2.17 The minimum frequencies of central office routines are specified in Bell System Standard Equipment Test Lists. Where the phrase ***specified intervals*** is used in Part 3, these lists should apply.

2.18 The evaluation should include observations of work in progress to identify:

- Are proper tools, test sets, cords, etc, available in good condition and proper calibration?

- Is the latest issue of the Bell System Practice (BSP) available and being followed?

- Is the craft person careful, proficient, and producing accurate results?

2.19 Time spent on the evaluation should be sufficient to appraise the effectiveness of operations. It is not intended that unlimited time be spent for an in-depth probing of every inviting facet of the job. Experience has indicated that most offices can be evaluated in two or three days. Due to the wide differences in offices, it is not practical to estimate the time required to effectively evaluate each operation. The evaluator should carefully budget the time available to allow completion of all applicable sections of the Plan within a reasonable period.

POST-EVALUATION REVIEW MEETING AND REPORTS

2.20 An important part of the Plan is the review and discussion of the evaluations results with local supervision and higher levels of management. The place (preferably the District Network Maintenance Manager's Office or equivalent) and time of the review meeting should be established in advance of the office visit and made known to management up to and including the Division Network Maintenance Manager or equivalent. If possible, it should immediately follow completion of the appraisal.

2.21 Form E-5126, Summary of Trunk and Special Service Evaluation, will be prepared by the evaluator for distribution by the local company in keeping with their practices at the time of the Post-Evaluation Review Meeting. The form provides a common document for recording the various evaluation findings contained in the Plan.

3. EVALUATION OUTLINE

3.01 The administrative principles used in this evaluation of trunks and special services are contained in the CM, FAP, PMI—for first-level Central Office Supervisors—PCRP, and the BSPs.

3.02 The evaluator will record the results of the evaluation on Forms E-5125, E-4979-4, E-4979 and E-6984, Checking Lists for Central Office Evaluation, Trunks and Special Services, Distribution Frames, Power Systems, and Special Verification Items—Digital Transmission Systems. These forms provide space for recording the ratings of the items to be evaluated and for noting information pertaining to deviations. The results of the evaluation are then summarized on Form E-5126.

RESULTS AUDIT

3.03 The purpose of this part is to provide a general validation of service and production results. The evaluator should discuss all audit irregularities with the supervisor prior to completing the evaluation. If significant irregularities become apparent in this overall evaluation, consideration should be given to conducting a detailed review of the office.

A. Trunks and Special Services

3.04 Provide an audit of the data used on the official service results reports (Forms E-3994, E-4223, E-5830, etc) for the last three months. This audit should be conducted on a sample basis and include a complete check of a few trouble tickets and a check of some computations. The base data, such as total trunks or served points, should be checked for reasonableness. Are all service measurements that were audited ***correct***? If not, determine which of the following audit irregularities apply to the errors revealed:

(a) Minor nonrecurring transcription error

(b) Major nonrecurring transcription error

(c) Recurring transcription error

(d) Base measurement irregularity other than transcription error

(e) Improper classification on one ticket

(f) Improper classification of tickets which affect the service results

(g) Minor nonrecurring discrepancy in computations

(h) Major nonrecurring discrepancy in computations

(i) Recurring discrepancy in computations

(j) Other—Describe.

B. Production, Trunks and Special Services

3.05 Review local time reporting procedures used by the supervisor. Sample several individual time reports for the current week. ***Do the time reports fail to properly charge accounts which reflect the work operations performed by the craft personnel?*** Does the supervisor have records of productive hours expended for the current year? Examine R, M, and 603-04 accounts. Look for pattern reporting (ie, 50 percent cross-connect, 50 percent upkeep, etc). ***Do these charges seem unreasonable?*** Review charges to the unmeasured and undistributed accounts and charges to central office accounts by other forces.

3.06 ***Do these expenditures appear to be unreasonable?*** If so, review the original supporting documents. Examine those charged to the "C" accounts. Be alert for unusual charges to the "C" accounts. Compare actual hours to the estimate authorization. Are any of the "C" charges unreasonable? ***Do the evaluations of a sample of work orders indicate that the documented work was not done?*** (See 3.14 for instructions.)

PLANT MANAGEMENT INSTRUCTIONS—TRUNKS AND SPECIAL SERVICES

A. Work Inventory

3.07 How is the work load determined? Has the supervisor identified all items of work? Have all corrective and preventive maintenance hours been identified? Have daily and demand type work hours been identified and is the amount of time established for these jobs reasonable?

B. Work Assignments

3.08 Review work assignment procedures. Is a specific job assigned to each craftperson or trick? Examine work assignments for two craftpeople. ***Do these work assignments provide a measurable quantity of work that would be considered a good day's work?*** Ask the supervisor what the craftpeople are supposed to be working on during their assigned duties? Are the work operations assigned productive and necessary? (Determine from the supervisor the reasons for several of the assignments.)

C. Force Availability and Punctuality

3.09 Make at least one formal check of force scheduled against force present and ready to work at the beginning of a principal tour. Be alert during the review for other evidence of late start or early stopping of work, including excessive time on breaks. Were any exceptions observed?

D. Roadblocks

3.10 ***Does the supervisor have a continuing program (observations of work in progress, etc) to identify roadblocks (eg, lost time due to missing instructions, missing or broken tools and test sets, waiting for other forces, etc)?*** If, in the course of the evaluation, personnel appear to be idle, determine from the people or from their supervisor the reason for the lost time. Determine when the last roadblock exercise was conducted. ***Is there evidence that the supervisor has a program to eliminate or reduce roadblocks?***

E. Circuit Orders, Service Orders, and Cross-Connection Work

3.11 This paragraph provides an outline to check circuit orders, service orders, and framework in the office not using the Frame Administration Plan. If the full distributing frame evaluation (Part 3 of this Plan) is to be made, omit these checks in this paragraph. Discuss the procedures for receiving, processing, and working a circuit or service order. ***Are the procedures for handling and processing orders efficient? Is the filing system simple and easy to use?*** Sample at least five recently completed orders. ***Were all the required tests made? Does the supervisor have documentation of test results (E-2545A or equivalent) and have all exceptions been properly handled or referred?*** Have all discrepancies been referred promptly to TIRKS or the Circuit Provision Bureau (CPB) for record reconciliation? Has this office missed any due dates during the past three months? ***Is it evident that the supervisor had prior knowledge of the due date and that all necessary steps were taken to meet the due date?*** Compare the total man-hours expended on the M account to actual man-hours of work performed by the frame force. ***Do these hours seem reasonable?*** Obtain a count of service and trunk order distributing frame load (eg,

equivalent jumpers) completed on the heaviest and lightest days in the previous month.

3.12 ***Do the number of frame personnel appear appropriate for this load?*** Determine how frame personnel are used during low-volume days or off-peak periods. ***Is the effective size of the work force adjusted to load fluctuations by borrowing and loaning or by doing other productive work? Are production records maintained on individual craft people?*** Make a brief inspection for deferred distributing frame work (eg, left-in jumpers) and work quality (SSP/SSM production, proper solder, etc). ***Does the frame job appear in order?***

F. Work Evaluation Program

3.13 Review the experience levels of the craft personnel on their respective job assignments with the supervisor. Determine what work evaluations have been made and recorded (Form E-5492). ***Do the number of evaluations per person vary according to the experience of the person? Has an adequate number of evaluations been made on every person in the previous months? Have a sufficient number been observed of work in progress? Do all evaluation records contain specific remarks (good or bad) about quality and productivity?*** Determine how work observations are used by the supervisor. ***Are there any specific examples where work observations have led to formal training, on-the-job training, discipline, or intensified observations?***

3.14 Select a small sample of several reports of recently completed work (eg, service reports, trouble tickets, T and I work orders, etc). If possible, these should relate to equipment or service weakspots which may have been revealed earlier in this evaluation. Ask the supervisor to inspect these jobs (sample portions of T and I orders). Does the supervisor evaluate the job exactly as required by the BSPs or other applicable instructions? Is it performed and in a manner that does not adversely affect service? Do the results of the evaluation indicate that the trouble was cleared and that the work was necessary and done in accordance with the BSP? Does it appear that the work was not done or that the time charges were fraudulent?

G. Training

3.15 Review individual training records (Form E-5491). Are both formal training and OJT documented on the training record? Are there sufficient numbers of trained personnel available to handle normal volumes of work on all types of equipment in the office? Is there any evidence of overtraining? Examine the local schedule for training (Form E-5459). Has formal school training been followed with on-the-job training and evaluation? Has an adequate training program been established for each individual (Form E-5459)? Has the Plant School fulfilled this office's off-the-job training requirements?

H. Forecast and Budget

3.16 Does the supervisor know what the work load will be for the next three months? Have corrective and preventive maintenance hours been identified in the forecast? Review upkeep and rearrangement hours for the previous six months. Have these hours, for the previous six months, been within 5 percent of forecast hours? Determine the amount of deferred maintenance. Are the deferred maintenance hours that have accumulated less than normally done in one month? What impact is deferred maintenance having on service results and productivity? Is the present force adequate to meet forecast personnel requirements (including training) for the next three months?

3.17 Is the Supervisor's Report (Form E-5468) or Company equivalent used and filled out? ***Has a supervisor's group man-hour budget been specified for each month of the current year? Are the R and M budget objectives being met?*** What overtime controls are established? Examine the overtime for the previous four weeks. Does overtime vary significantly from week to week? Look for continued incidental overtime (one-half to one hour per day). Ask the supervisor to explain the reason for the overtime expenditures of the previous week. Are continued overtime levels great enough to support additional personnel? Determine what specific work was accomplished with the previous day's overtime. ***Is the use of overtime really effective? Does the supervisor receive each day for each craftperson the collected tickets, work orders, and other evidence of how each craftperson's time was spent?*** Arrange to examine this work for data for one day for each

craftperson in the supervisor's group. ***Does each work record indicate what an individual accomplished daily, and that it is done in a reasonable time and charged to proper code? Does the supervisor ascertain the reason for all major time deviations on preventive maintenance work orders?***

I. Safety

3.18 The evaluator should note items such as use of safety glasses, test equipment not strapped to rolling ladders, broken ladder steps, wire and equipment on the floor, etc, as they are encountered during the evaluation. The condition and last inspection date of fire extinguishers, rubber gloves, etc, should be noted. Are exit signs properly placed and lighted for emergency building evaluations? ***Are they satisfactory? The proper storage of combustibles is essential. Are oil, grease, paint, and other combustible materials stored properly?*** Discuss fire alarm procedures with one or two craftpeople. ***Do they know and understand the fire alarm procedures?***

3.19 ***Note evidence of smoking in unauthorized areas. Are the craftpeople knowledgeable about fire alarm arrangements and fire fighting procedures? During the course of the evaluation, were any safety hazards detected? Were all personnel observed working safely?*** Discuss safety training and determine the subject of the last safety lesson with the supervisor and one or two craftpeople. ***Are effective safety meetings scheduled and conducted regularly?***

J. Housekeeping

3.20 Central office housekeeping must be of a high standard if equipment troubles are to be held to minimum levels. Unless controlled, dirt can become a serious service problem in any office. Excessive dirt on the floor and on flat equipment surfaces are obvious indicators of existing and potential troubles. Take particular note of the floor and equipment near entrances, ducts, windows, and the work center for evidence of dirt entering the equipment room. Inspect (on a sample basis) relays and switches mounted toward the bottom of equipment bays. ***Are floors and equipment clean?*** While walking through the office, note open equipment covers, missing or unseated relay covers and tools, test sets, drawings, BSPs, etc, left unattended for long periods in the work area. Is it evident that the craftpeople practice good housekeeping in their work procedures? Inspect the storage facilities for wire, test sets, plug-in equipment, relays, etc. ***Are the storage arrangements adequate and appropriate for the type of material being stored? Are shipments of equipment and supplies unpacked outside the office or in a protected area?***

K. Buildings

3.21 Observe the condition of the floor, ceiling, walls, etc. Look for such items as loose plaster, loose or chipped paint, broken floor tiles, excessive cracks, and water leakage.

3.22 Is the office free from building defects? Note the temperature near high-heat emitting equipment frames. Are the temperature and humidity controlled at proper levels? Review building alarm arrangements and procedures. Are adequate controls in effect (including out of hours) to assure prompt correction of building alarm conditions? ***Does the air-conditioning system provide a slight pressurization of the equipment room so dust and dirt are forced out of the equipment room when doors are opened?***

L. Security

3.23 Security measures are intended to prevent unauthorized access to central office quarters. Is access to central office quarters controlled? Are approved admission procedures followed?

M. Installation Items

3.24 Discuss with the supervisor a recent installation job requiring a Method of Procedure (MOP). ***Did the MOP contain detailed service protection procedures and was it approved by Plant and Installation supervisors and other involved departments?*** Was a test and analysis committee or company equivalent established to evaluate the job, and was it effective? Review the reports pertaining to troubles caused by installation activity. Review the performance indicators and the Service Results Reports during the installation. ***Were the controls effective in limiting service reactions? Is there***

good coordination and a proper working relationship between the Telco maintenance supervisor and the installation supervisor?

N. Supplies, Test Sets, and Tools

3.25 Supplies, test sets, tools, and technical information should be available in the proper type, vintage, and adequate amounts. Determine how these materials are controlled (new orders, back orders, etc) and examine the storage arrangements.

3.26 Are spare equipment units, apparatus, and piece parts appropriate (eg, items vital to good service or which are numerous or prone to failure should be stocked)? Are there excess amounts of "defective" plug-in units on hand? Are wire and other supplies stocked in sufficient quantities to care for reasonable abnormal needs, yet not in excessive amounts? Are only the necessary test sets available in the office and are others available on a loan basis? Are stocks of tools and supplies with home or commercial application secured properly and their usage monitored?

O. FCC Regulations

3.27 FCC radio station licenses and logs are required by Federal Law. Are current radio station licenses posted in the approved manner? Are the appropriate radio station logs maintained in the approved manner? Are log entries current? Are current issues of the appropriate FCC rules available? Are radio station maintenance personnel radio licenses posted in the approved manner at the designated centralized maintenance center? Is a list of radio station maintenance personnel with radio license numbers and expiration dates posted at remote radio relay stations in the approved manner? Are the appropriate radio alarm logs maintained at the alarm center serving remote radio stations? Are the appropriate "antenna structure" lighting facilities provided and operating in accordance with Part 17 of the FCC Rules and Regulations (Section 400-100-003)? Is the radio station audited periodically in accordance with the appropriate BSP (Sections 400-300-002 and 400-401-000—Microwave)?

SERVICE RESULTS—TRUNKS AND SPECIAL SERVICES

3.28 This section provides procedures to be used when evaluating that portion of the Trunk and Special Service job generally referred to as the ***service*** job. The questions provided are applicable to any type of service results (eg, Trunk Transmission Maintenance, Trunk Service Results-Outage, Special Service Results for telegraph, telephone, data, program, television, special service network, etc). The evaluation procedures may be applied to a System Standard Measurement Plan or a Company Plan.

3.29 The evaluator should use this portion of the evaluation procedure to determine the circumstances causing unsatisfactory results and the adequacy of response and control. Particular attention should be directed to the interrelationship of Service Results and Controlled Maintenance, even though two or more supervisors may be involved.

3.30 Prior to reviewing service results with the supervisor, the evaluator should complete the Results Audit and the applicable portions of Plant Management Instructions as covered in Part 3 of this Plan.

3.31 The evaluator should review all performance indicators prior to the evaluation visit. The evaluator should identify areas of unsatisfactory performance and be prepared to review each with the supervisor. The evaluator should note trends, either up or down, and determine the reason for the change. Attention should be directed toward the response of Controlled Maintenance (CM) to Service Results. Does CM respond adequately and economically, or does CM under or over respond in an uneconomic fashion?

3.32 Review with the supervisor the weakest component in the results. Is this component an index of 95 or below? Examine the tickets or other records related to this component. Do these records provide sufficient data to determine the reason for this performance? Is it evident that the supervisor is aware of this level of performance? Through a discussion with the supervisor, determine what steps he ***has taken*** to improve this component. Sometimes an erroneous decision or conclusion is based on "seat of the pants" ***intuition,*** not ***solid documented evidence!*** Has the supervisor applied timely and effective control measures? (If no results components are unsatisfactory, it is assumed that effective controls are in use.) Are all other components above a 95 index?

3.33 In some cases, service results are directly related to the activities of other groups in the central office. ***Are the number of work errors acceptable as they relate to this service result? Does the supervisor relate trends in service indicators to the necessity for routine equipment maintenance?*** Examine the tickets or other records for indications of central office equipment or facility troubles. Is the supervisor aware of the corrective maintenance procedures of Controlled Maintenance? Are troubles in a particular type of equipment or facility recorded and properly coded in the E-5840 forms and are they part of the corrective maintenance analysis? Is there an obvious procedure in effect to control or reduce troubles to improve service results? ***Have all these troubles been included in the corrective maintenance analysis of the Controlled Maintenance Plan?*** In larger central offices, the activities of several first level supervisory groups may affect a service result. ***Is the supervisor aware of this and has a reasonable effort to coordinate efforts to maintain and improve service been made? Can the supervisor quantify the impact of deferred Preventive Maintenance on Service Results?***

CONTROLLED MAINTENANCE—TRUNKS AND SPECIAL SERVICES

3.34 This part is an evaluation of the effectiveness of the various essential steps in administering the trunks and special service in an office under the Controlled Maintenance Plan principles. The purpose is to check that the necessary indicators are being observed and that the information obtained from these indicators are being recorded and analyzed effectively, with the final result that work assignments are productive and quickly responsive to indications of equipment malfunctions which are or soon will be affecting service.

3.35 The evaluation of the CM job for trunks and special services is not merely a passive checking off of procedures which the local force says it understands and uses. While recording of data for subsequent analysis is an essential part of CM, it must not be confused with an effective CM job. ***The true measure*** of the job is in the "effectiveness of the analytical process" in "triggering corrective action" or further investigation. The evaluator must seek specific examples of appropriate decisions resulting from analysis. To some extent the evaluator must duplicate the analysis performed by local forces to verify the thoroughness of the Controlled Maintenance job.

3.36 The evaluation is expected to apply CM concepts to the central office equipment and the testing work on trunks and special services, since CM routine tests are performed from the various test positions, test frames, testboards, etc, serving trunks and special services.

3.37 The CMP part is divided into two segments entitled Corrective Maintenance and Preventive Maintenance. The evaluator must determine how these procedures have been implemented and if a proper balance of corrective and preventive maintenance has been obtained. If the full Power Plan evaluation is to be made, refer to the Power Equipment Evaluation part of this Plan for CM considerations that apply to Power Plants.

A. Corrective Maintenance—Trunks and Special Services

Trouble Ticket (Form E-5840)

3.38 Select ten tickets at random from the file. Are the tickets legible and do they contain adequate information to indicate the equipment involved, the nature of the trouble, and the action taken? Are the tickets properly coded? Are they filed correctly? Note the clearing time and work time recorded on the tickets. Are these entries reasonable? Do the actions taken seem appropriate for the trouble reported? Are the backs of tickets filled out when required, as a log of action taken? Has the supervisor checked all tickets? Check to see that all sampled tickets are recorded on the log, when applicable.

Central Office Log (Form E-5457)

3.39 Determine if tickets are entered on the log when issued and promptly posted when completed. Are "open" trouble tickets carried over? Are ticket entries correct and entered at the time the ticket is issued or within a reasonably short time after that? ***Do the entries on the log indicate a complete recording job (eg, major incidents noted on the log)?*** Is the log closed out periodically and open trouble reports carried forward? Does the supervisor use the log to obtain a picture of the daily operation and to determine the status of all trouble reports? ***Does***

the supervisor know the reason for "carried over" or "open" tickets from the previous day?

Control Record (Form E-5841)

3.40 Have trouble reports been posted for each day on a cumulative basis? Have reasonable trouble expectancy objectives been determined and posted? Evaluate the use of the Control Record made by the supervisor. ***When expectancies have been exceeded or trouble rate trends show increases, has appropriate action been taken?*** If trouble rates are satisfactory, it is assumed that proper action has been taken.

Trouble Summary (Form E-5463)

3.41 Check that appropriate equipment groups are listed and that they are similar to the categories in the ticket file. Have all necessary ***entries been made and are they correct?***

Ticket File

3.42 From the ticket file, take all tickets from two bins with more than the average number of tickets. Scan the tickets for repeated similar troubles (adjustment, component, etc) in the same equipment area. Has appropriate action been taken to correct repeated troubles? For example, if adjustments are a problem, are steps under way to check common sources, such as carrier or frequency supplies? If no repeated troubles are detected, it is assumed that proper action has been taken.

Trouble Tally (Form E-5844)

3.43 Have the supervisor explain what in-depth analysis has been conducted when trouble trends exceed objectives. If the number of trouble tickets to be analyzed is low enough (approximately 25), direct analysis of trouble tickets of a particular category should be used. If the number of tickets is too high to permit direct analysis, a Trouble Tally should be used. Has the use of the Trouble Tally or appropriate ticket analysis been correct?

B. Preventive Maintenance—Trunks and Special Services

3.44 Evaluate the preventive maintenance program and schedule (E-5451) in effect in the office. Sample several applicable ETLs to determine if a schedule has been established for all tests listed in the ETLs (E-5450) which are applicable to this office. Have work times (actual averages or estimates) been established for each work item? Has the supervisor estimated the time to complete work on all scheduled items and are the estimates reasonable? Has the supervisor's time estimate been adjusted when significant differences from actual continue to occur? No significant deviations on the sampled work orders imply that this has been done. Have the supervisor's time estimates been used to establish a work schedule which is keyed to variations in available force (eg, due to vacations and the variations in work load)? Are deferred preventive maintenance hours reported correctly (eg, a quarterly routine should not be counted double if it is passed twice) in writing to upper management?

3.45 Select ten recently completed Test and Inspection Work Orders (E-5452) for Mandatory Work (MW) routines. Include several Mandatory Review (MR) routines in the sample when applicable. Are similar tasks and like equipment units grouped efficiently on the same work order (E-5455) to avoid unnecessary setup time and paper work? Are job sizes reasonable and are the tests arranged in an efficient manner? Is the time recorded on all of these forms? Compare actual time to estimate time. Is the estimated time reasonable, and is the work time difference acceptable? Large differences are acceptable if appropriate reasons have been noted on the work order. Determine the basis for decisions to do or to pass MR work. Does the supervisor demonstrate valid reasons for doing the T and I work orders that were reviewed? If the scientific sampling technique has been used and the sampling data and results are available, was it done correctly? Has there been a valid need to use scientific sampling? Has the use of scientific sampling been correct?

3.46 Determine what use is made of automatic test equipment by observing this equipment in the office. Are all automatic test frames operative? Are all automatic test lines (ie, 100, 102, 103, 104, 105, 107, 108, SYNC, etc) operative? Is the automatic test frame data base up-to-date? Are all automatic test frames operated continually during covered hours? Does the office have a schedule of tests to be made using the automatic test frame? Have the test frames been used productively? If automatic test frames are not

provided in the office, sample several units of portable test equipment. Is the test equipment functioning properly (eg, returned for periodic tests per red ball plan)? Are CAROT center reports recorded properly and are they handled promptly? Are milliwatt distribution supplies and outlets calibrated at the specified intervals?

C. Controlled Maintenance Impact on Service Results

3.47 Determine if the supervisor is aware of the impact of the corrective maintenance trouble volume on service results. ***Does the supervisor know how many trouble reports per day (in various equipment categories) can be tolerated before service results drop below the satisfactory level?***

3.48 Determine if the supervisor is aware of the impact of the preventive maintenance volume on service results. ***Does the supervisor know how much preventive maintenance (in various equipment categories) effort per day is required to "control" (hold) corrective maintenance trouble volume low enough to ensure satisfactory service results?***

MANUAL TESTING—POSITIONS, FRAMES, AND BOARDS

A. General

3.49 Manual circuit testing for circuit order, routine, and trouble is performed from the various test positions, test frames, and testboards provided. These circuit test provisions fall into two distinct test access categories—switched access and jack access to the circuit under test. Beyond the test access arrangements, circuit testing operations require the same fundamental administrative support and supervisor to provide efficient quality circuit testing work.

B. Testroom Equipment and Records

3.50 Observe the general appearance of the testroom. Does it have a professional businesslike appearance conducive to efficient testing operations? Are all circuit designations clear enough to prevent work errors? Have all test sets been recalibrated within the prescribed interval? Is all supporting equipment (cords, headsets, etc) in good condition? Are the required portable test sets available at the test positions? Are the appropriate individual circuit and facility records available at the test positions?

C. Testroom Operation

3.51 Does the operational activity of the testroom appear efficient and businesslike, without confusion? Are incoming calls answered promptly? Are trouble indicators and alarms (printouts, displays, lamps, bells, etc) answered promptly? Are trouble tickets prepared promptly on all circuit troubles as they are reported (by incoming calls, printouts, displays, lamps, bells, etc)? Are circuits properly removed from service? Are all patch cords properly placed, tagged, and dated? Are patch cords left up for an extended period of time (more than 30 days)? Do the craft personnel understand the importance of prompt restoral of priority circuits? Do the craft personnel respond appropriately to, and escalate extended outage conditions to the supervisor? Are any unsafe acts or conditions observed? Are there problems existing the supervisor is not aware of?

D. Testroom Administration

3.52 The majority of the testroom administrative aspects are covered by the service results, plant management instructions, and controlled maintenance portions of this Plan; however, there are a few items that apply primarily to the testroom. Is the supervisor really "involved" in the administrative operation of the testroom? Does the supervisor have a clearly defined plan for:

- The esclation of extended outage?
- Prompt restoral of priority circuit outages?
- Securing message circuits to provide temporary restoral of special outages?
- Handling restoral of trunk and special outages caused by major facility failures?

Do the testroom craft personnel understand these restoral plans?

PLUG-IN INVENTORY CONTROL SYSTEM (PICS)

3.53 Locations operating under the PICS program should have available the appropriate PICS practices, forms (ie, inventory, transmittal, defective tags, etc), adequate stocks of maintenance and

circuit order spare plug-in units, properly designated and stored. ***No defective plug-in units should be found in storage. Are plug-in units found defective, immediately tagged with the PICS defective tag and returned to the PICS coordinator the same day?*** Are spare plug-in inventories clearly designated Maintenance or Circuit Order? Are these excessive maintenance spare plug-in units based upon the local trouble rate history? Are the excessive circuit order spare plug-in units based upon the local circuit order activity history? Are disconnected plug-in units promptly marked circuit order spare and placed in the designated storage area? Is the PICS Central Office Activity Report (COAR) transmitted to the PICS coordinator on the same day a plug-in is removed on a disconnect order? ***Are maintenance, or circuit order, or nondesignated spares found in plug-in mounting bays and frames?*** Are satisfactory storage arrangements provided for maintenance and circuit order spare plug-in units? Are returned plug-in units packaged in the approved manner to prevent damage in shipment? Are Styrofoam* shipping containers stored in accordance with fire regulations? Is the PICS program providing the necessary plug-in units in time to meet circuit order test and service dates?

*Trademark of Dow Chemical Company

DISTRIBUTING FRAME EVALUATION—TRUNKS AND SPECIAL SERVICES

3.54 The evaluator will record the results of the frame evaluation on the work sheet, Form E-4979-4 (TA-TD). The form provides space for rating the items and for noting information pertaining to deviations. The results of the evaluation are to be summarized on Form E-5126. This evaluation consists of six sections. The sections are: (1) Trouble Control, (2) Circuit Order Completion Control, (3) Production Control, (4) General Frame Administration, (5) Frame Personnel Development, and (6) Safety.

3.55 The administrative principles used in this evaluation are contained in the Plant Management Instructions for First-Level Distributing Frame Supervisors, referred to hereafter in this evaluation as the "Frame Administration Plan."

A. Trouble Control

3.56 Examine Form E-5497, Frame Control Record, with the supervisor. Are frame-caused trouble records logged in the Control Record? A frame trouble report is a trouble report which is not found or suspected to be due to other related equipment or system trouble. Have realistic objectives been established? If so, are the objectives being met? For a recent period, compare the number of frame trouble reports to the total "M" hours of distributing frame work shown on the Production Report (Line 17C, Form E-5926). Is the rate satisfactory (less than three trouble reports per 1000 hours)? Are all frame trouble reports reviewed by the supervisor? Are work error records kept by individual craftperson? Does the supervisor analyze to identify problem areas of frame activity (eg, broken, reversed, and cut jumpers) experiencing high trouble rates? If so, determine what is being done about the problem.

3.57 Look at the Circuit Order Log (Form E-5495) for the last few days. Are circuit order discrepancies logged? For a recent period of at least one week, are discrepancies less than 5 percent of the total number of circuit order activity items shown on the Jumper Count (sum of line A, all columns, Form E-5958)? Does the supervisor use the Circuit Order Log to identify the source of the discrepancies? Does the supervisor actively work toward reducing discrepancies? For example, if TIRKS or the Circuit Provision Bureau (CPB) errors are high, does the frame supervisor summarize the discrepancies and attempt to resolve them with the TIRKS or CPB supervisor and discuss the problem with his or her immediate supervisor?

B. Circuit Order Completion Control

3.58 Discuss the circuit order (CO) "flow-thru" with the frame supervisor. Is the flow of orders (ie, handling and processing orders) efficient? Are all circuit orders screened prior to starting work, and does the screening process include checks to make sure that all required entries are made on the order, that the order is legible, and that enough information is provided about the equipment when unusual work is involved? Are the work items checked, coordinated, and logged in an efficient manner for the craftpeople (ie, does a dispatcher or a clerk do this work when practical)?

3.59 Does the frame supervisor have a policy of prebuilding the bulk of all frame work items prior to the due date? Sample at least five circuit orders due-dated for the day after the evaluation which were received the day before the evaluation. Are all the sampled orders already prebuilt or being built? Sample five or more orders with today's due date. Have all sampled orders been processed and sent to the frame in a satisfactory interval after the orders were negotiated?

3.60 Review the CO filing system. Select several CO numbers from the previous week's CO log and ask to have the actual orders pulled from the file. Does the filing scheme seem simple and easy to use? Are there adequate arrangements for identifying pending work? (Examine all or a sample of the orders for three working days hence.) Are all completed COs made available to the supervisor for a quality check before the orders are filed? Is there unnecessary duplication of filing or dispatching?

3.61 Is a log established (Form E-5495) which identifies delays, discrepancies, or other problems, and the reasons for them? Are enough details provided about the problem to make the log comprehensive enough for subsequent use by management? Is the time recorded when delays and discrepancies are encountered and cleared? Is the average time to clear discrepancies satisfactory? Are only those orders with problems or requirements for follow-up and coordination recorded on the log? In most offices, it is not necessary to log all orders; if the trouble rate is extremely high, however, it may be acceptable to temporarily log all orders.

3.62 Determine what controls are established for "bulk" rearrangement orders such as load balancing rearrangement orders or facility "rolls." Is a log established (Form E-5498 or equivalent) which provides a summary of these orders and their current status (eg, TDF prewired, jumpers removed, etc)? Is the time to complete individual bulk orders estimated by the supervisor? Are all incompleted bulk orders less than one month old? Have pullouts been completed in a reasonable time? (Sample several orders to verify the log.) Examine several of the oldest circuit rearrangement orders. Are adequate procedures used to update these orders with CO generated changes, and are proper procedures used to ensure that working circuits will not be put out of service in error? Have due dates been met on all circuit orders for the last month?

3.63 Review the use of the Trunk and Special Services Log (Form E-5495 or equivalent). Is the log used to provide a summary of the orders and of their current status, and is the reason for delay listed in Remarks? For the last month, have due dates been met (frame work complete), and are pullouts shown completed in reasonable time? Sample five recently completed trunk orders. Is a sketch or diagram available which details the jumpers to be run by the frame person (eg, cable to repeater, etc)? Are all entries pertaining to the order complete and accurate (eg, logged on control record, jumpers pulled)?

3.64 Determine by review of Training Records (Form E-5491) if craftpeople are trained in proper testing procedures (eg, are the testing procedures itemized for the craftpeople)? Determine by observation of several craftpeople what the testing procedures are with regard to working circuit orders. Are working circuits monitored prior to cutting the jumper? Are working circuits to be disconnected or transferred verified prior to cutting? Upon completion of a circut order, are all steps of the wiring verified (tested)? Do the number of trouble reports (missing jumpers, cut jumpers, disconnect in error) indicate that an effective test procedure is in force and that proper caution is used? Are insulated soldering tips used exclusively on all soldering irons? Is a log or other control record maintained of work directed by the test people (eg, coils removed, reversing shoes placed)?

C. Production Control

3.65 The frame job is primarily a production job when compared to equipment maintenance, which is primarily a technical job. This evaluation is intended to measure the supervisor's control of frame production and quality. The use of the production control records discussed in the Frame Administration Plan is recommended; however, local forms which provide similar control functions are acceptable.

3.66 Was a time study made to determine how long it actually takes "on the average" (raw time) to run and disconnect frame and other types of cross-connects (Form E-5924)? Does the study have statistical validity? (Is the number of orders

sampled adequate; is the proper type of order sampled?) Do "raw time" estimates seem reasonable for the size of the frame?

3.67 Was a study made to determine how many jumpers are required for the various types of COs and bulk rearrangements and the equivalent jumpers for the various types of recurring work items in the office (Form E-5958)? Is the frequency of updating such studies in accordance with company objectives?

3.68 Examine the frame production control records (Form E-5926 used in the office). Does the production report include all hours expended for the frame job (undistributed time, training time, productive work time, etc)? Do the total hours listed (less borrowed help) approximately equate to the number of frame items actually worked during a given period, and also the equivalent jumpers (EJs per hour)? Has the supervisor used the average EJ per hour rate to estimate the man-hours required to complete the day's work load (CO, trunk order, etc)? Has the supervisor identified all hours used by the frame forces to perform major duties (jumper running, dispatching, testing, etc)?

3.69 Has the production performance (in terms of EJs per hour) been trended by the supervisor (Form E-5957)? Is the trend of frame productivity (EJ per hour) showing improvement? Examine the weekly production (or EJs worked and hours spent) performance. Has the supervisor used weekly production trends to tell if the frame people are fully loaded, and does the supervisor adjust the size of the force (eg, loan people out, reduce size of force, borrow people, etc) when the EJ per hour rate or work load changes? Is productive and necessary "fill-in" work provided and immediately available (eg, is the amount of observed "standby time" excessive)? Has the supervisor established realistic productivity objectives?

3.70 Discuss with the supervisor how the work load and man-hours are forecast for the next day, next week, and next month. Are positive contacts made with supervisors controlling the input of work to the frame (eg, Circuit Provision Bureau supervisor, Traffic Dial Service supervisor, WE foreman) to forecast load data used to forecast load (number of items and/or EJs run per day, average time per EJ)? Ask the supervisor what is the daily load of circuit orders, rearrangements, etc, for this particular time of month. Has the supervisor estimated the man-hours needed for the next day's work load and for the next week's work load? Using all input documents...("Trunk Order Log," Form E-5495, "Rearrangement Log," Form E-5498, "Trunk and SSO Jumper Count," Form E-5958, etc), determine if the work force is properly adjusted to meet the load. Does promptness of completing "go-aheads," the general physical condition of the frame, accuracy of records, and the productivity results indicate that the force is properly matched to the average work load? Examine frame overtime expenditures in the last month and the evidence that overtime was required. Look for continued incidental overtime (one-half or one hour per day). Does the supervisor properly control the use of overtime? Are the supervisor's work load estimates used to make manpower forecasts and budgets?

3.71 Ask the supervisor how the craftpeople's job is organized to work prebuilt orders, disconnects, rearrangements, trunk orders, and record purification. Are those orders worked in bulk fashion whenever possible to maximize production, rather than one person doing the complete job (eg, TDF, IDF, etc)? Does the supervisor estimate the work time when bulk work assignments are laid out?

3.72 What does the supervisor identify as his weak areas (eg, discrepancies, record errors, late orders, employee-caused troubles) which are causing lost productive time? Do the areas defined by the supervisor actually appear to be the major problems? Does the supervisor have an effective plan to correct these weak areas (eg, documentation, higher management support, roadblock meeting, etc)?

D. General Frame Administration

3.73 Management has the responsibility to provide aids to the craftpeople which will assist in doing a quality productive job. Are adequate supplies of wire, solder, spare heat coils, and carbon blocks conveniently available? Are adequate spare solder irons and parts, pliers, test gear, and other tools available? Have sample wiring charts and diagrams been posted to aid the craftpeople in laying out their work (eg, foreign exchange line with DLLS, repeater strapping, etc)? Have equipment, trunk cable, and tie cable location charts been posted to aid craftpeople in locating circuits

on the horizontals and verticals? Sample cable and block stenciling. Does the stenciling provide easy and accurate identification of pairs (check verticals with several cables)? Is the stenciling satisfactory (check for improper restenciling and old worn horizontal/vertical coordinates)?

3.74 Are Work Description Lists (Form E-5474) provided for all frame people, and are Job assignments (Form E-5465 or equivalent) posted? Do work description lists provide flexibility to handle higher priority jobs? Review the frame coverage schedule. Is adequate supervisory control provided for all shifts?

3.75 Review the supervisor's program for frame routines. Are the routines scheduled and controlled in accordance with the Controlled Maintenance Plan (Forms E-5450 and E-5451)? Have the following items been worked on in the previous three months: record purification, daily housekeeping, dead jumper control, vacuuming blocks, reconditioning vacant terminals, tool and test set repair, and ladder conditioning?

3.76 Is the frame and work area (eg, racking frame room paint, etc) professional in overall appearance? Is the atmosphere conducive to a good quality job and to the proper training of craftpeople (eg, clean spare lugs, adequate wire bags, room for material storage)? Is the frame free of jumper congestion problems which cause roadblocks (inspect for excessive dead jumpers evident and for 3-1/2 inch clearance on middle shelves)? Is a formal program in effect to control or reduce shelf congestion (eg, evidence of dead jumper removal, reengineering, etc)?

3.77 Is Section 460-110-100 on SSM and SSP readily available in the work area? Are local instructions posted, and are craftpeople trained on proper procedures (examine training record)? Are adequate supplies of SSM/SSP protective devices available at the frame? Ask the supervisor what controls are used to ensure that SSM/SSP are provided. Are all COs requiring protection processed properly (sample ten SSM/SSP orders)? Does the supervisor inspect most SSM/SSP work completed?

3.78 Ask the foreman what completion priorities are assigned to various frame activities. The Frame Administration Plan suggests the following order: (1) new circuits, (2) disconnects, (3) rearrangements, (4) complete due dates, and (5) complete advance work. Are appropriate completion priorities established? Are the frame people trained as to the priority of work (eg, priorities posted)? Does the frame provide adequate service to the toll testboard? Are contacts with TIRKS or the Circuit Provision Bureau handled efficiently? Are circuit order completion notices transmitted promptly?

E. Frame Personnel Development

3.79 Determine the experience level of each frame person. How many have less than six months' frame service; between six and twelve months? Examine the Work Evaluation Records (Form E-5492) of the frame people. Have appropriate numbers of evaluations been made on all frame people (dispatcher, trouble person, and production crews) every month for the last six months? Is the number of evaluations greater for new frame people? Are the number of evaluations about equally divided between inspection of recently completed work and observations of work in progress?

3.80 Ask the supervisor how he or she trains new frame people. Does the supervisor have and use an on-the-job training program? Are individual training records established, kept current, and is a Training Schedule (Form E-5459) established? Is a complete set of BSP sections pertaining to the frame job available in the frame area? Ask several new craftpeople what procedures they use when working COs. Are these people familiar with correct standard procedures and adequately trained for the job they are performing?

F. Safety

3.81 Are safety training meetings scheduled and conducted as required by company policy? Are records kept on safety training for each frame person? Is adequate safety training provided to all new frame people when they begin working? Ask several frame people about the use of proper high-voltage protection procedures and fire fighting procedures (alarm locations, use of CO_2 versus water, etc). Are the people familiar with the proper procedures? Are eye protection devices used in accordance with company policy?

3.82 During the observation period, was the frame free of housekeeping hazards (eg, loose wire on floor, test set or ladder without straps, test cords and equipment improperly stowed)? Inspect the ladders used at the frame. Are ladders free

of hazards (eg, splinters, defective brakes, etc)? Are electrical tools free of safety hazards (eg, frayed cords, improper grounding)? Are fire protection devices available and ready for use (checked at proper frequency)?

POWER EQUIPMENT EVALUATION—TRUNKS AND SPECIAL SERVICES

3.83 Failure of power equipment can result in major service impairment affecting all central office services. Neglected power equipment not only can be a service hazard but also can drastically reduce battery life and increase maintenance cost.

3.84 The power evaluation is composed of eight sections: (1) Emergency Engine, (2) Batteries, (3) DC Power Plant, (4) Rectifiers, (5) AC and Frequency Supply Power Plant, (6) AC Power Service, (7) Safety, and (8) General Items. The evaluator should record the results of the power evaluation on the work sheets, Forms E-4979-TA through TD. The results recorded on Forms E-4979-TA through TD are to be summarized on Form E-5126.

3.85 ***Apply extreme attention to the safe working practices when in the power room, particularly in regard to exposure to rotating machines, high voltages, and corrosive chemicals. The evaluator must avoid wearing loose clothing or jewelry during this evaluation and must never touch current-carrying parts and ground simultaneously.***

A. Emergency Engine

3.86 Are engine operating instructions available where they can be seen while starting the engine? Do the operating instructions include a simple clearly defined, step-by-step procedure for starting and stopping the engine (standard chart or local equivalent)? Is adequate emergency lighting (in working condition) provided in the engine area? Are adequate safety devices provided for eye and ear protection?

3.87 Examine the "Engine Run Log," Form E-5697. Does the log provide a complete continuing record of all engine runs and related performance data, including details of problems when encountered? Has the engine been run at least at prescribed minimum frequency intervals for the last six months (weekly for diesel, monthly for turbine)? Does the duration of the engine run meet requirements (Diesel—less than 100 kW = 1 hour, 100 kW = 2 hours, greater than 350 kW = 3 hours; Turbine = 1/2 hour)? Is the engine run with the prescribed percent of office load? Analyze the engine performance data. Look for changes occurring over a period of time (eg, oil pressure dropping, excessive cylinder temperature variation, etc). Does the performance data indicate that the machines are running properly?

3.88 Have each emergency engine started. Are all emergency engines operable and available for service? If an engine is out of service for maintenance and if spare capacity is available, the previous questions may be answered "yes." Are the posted starting instructions followed and are they correct? Are qualified personnel (minimum of one per shift) able to start the emergency engine and connect to office load? Examine the exhaust system just after the engine is started. Is the exhaust system free of leaks? Is an adequate supply of "outside" air provided to the engine (indications of negative air pressure around doors, windows, etc, may mean inadequate air supply)? Does the engine run free of serious oil and water leaks? Are maximum and minimum performance readings defined, and does the machine run within these limits?

3.89 Determine how portable engines are used to provide power and examine the method for making connections. Can connections be made quickly, and is the method of connection clearly described? Does the method of connection avoid violation of building security?

3.90 Examine Controlled Maintenance Test and Inspection (T and I) summaries and/or battery records for the starting mechanism. Is the starting mechanism for each engine adequately maintained (fully charged batteries or adequate compressed air available)? Is an emergency shutdown switch provided at a safe location (preferably out of the power room)? Does the emergency (dc) air compressor operate properly? Are the compressed air tanks drained at specified intervals?

3.91 Examine the crankcase oil. Is the oil level proper, and is the oil changed or analyzed at the proper interval? Examine the latest analysis report, if used. Is the oil free of waterdrops? Have air, fuel, and oil filters been changed at

prescribed intervals? Are antifreeze and rust inhibitor used in coolant water when required? Ask the supervisor to estimate the engine running time provided by the fuel on hand. Is the fuel supply adequate (ie, enough to provide time to secure additional fuel)? Has the required fuel oil additive (inhibitor) KS-19298-L4 or analysis been used, and has a periodic check for water in the fuel tanks been conducted?

3.92 Are the engine manufacturer's manuals and bulletins available? Have instructions been posted which give adequate guidance should the engine fail to operate (eg, BSP sections, telephone number of engine repairman)? Are basic emergency tools (such as wrenches) kept on hand? Do the engine (overspeed, high temperature, low oil pressure, etc) automatic shutdown controls work?

B. Batteries

3.93 Examine the storage battery record (Form E-3592 or equivalent) on which the weekly pilot cell readings and the annual average battery float voltage are recorded. Have weekly voltage readings and 6-week specific gravity readings of the pilot cells been recorded for the last six months? Are the pilot cell voltage readings within the limits established in the average float voltage determination? Do the specific gravity readings vary less than four points (0.004) in six months? If valid reason is given (eg, water added), the excessive variation may be acceptable. In case of deviation of either voltage or gravity, has proper action been taken?

3.94 Review the "Quarterly Individual Battery Cell Voltage Record," Form E-3593. Have individual cell voltage readings been made as required for the last year? Are individual cell readings currently above minimum levels as specified in Section 157-601-701? If cell voltages were previously low, was a boost charge given to the cell?

3.95 Have the semiannual individual cell specific gravity readings been completed and recorded on Form E-2003? Is the specific gravity of all cells within limits (ie, 1.180 to 1.225 for low-gravity cells)? Has the specific gravity of all the individual cells dropped less than 0.004 in six months and less than 0.006 in the last year? If acceptable reasons are given for the variance (eg, effect of boost charge) or proper action (reports, etc) was taken, the previous question should be answered "yes." Has a boost charge been given within the last year, and were all individual cells brought to acceptable levels after the last boost charge? If the plant is not arranged for boost charge, the individual cell charger should be used.

3.96 Have quarterly Lead-Acid Storage Battery inspections been scheduled and completed [see T and I Summaries and Work Orders for the ETL (Section 157-001-013)] during the last year? Have all deviations recorded been eliminated, or are steps being taken to eliminate the deviations? Is the water which is used to replace evaporated water low (Section 157-601-701) in mineral content? (If tap water is used, ask to see the latest analysis report.) Is the power room ambient-temperature between 65°F and 85°F (high-temperature reduces battery life)?

3.97 Are sample cell discharge tests (Sections 157-601-502, 157-601-503, 157-601-504, and 157-601-505) made when required (AT&T EL 114)?

3.98 Inspect the physical condition of the batteries, taking particular note of cells with marginal readings. Are all the cells free of physical defects such as excessively raised cover (more than 3/4 inch), cracks, or bulging of the jar? Have all observed defects been noted on the Test and Inspection Summaries or on other permanent battery records? If there are no defects, answer previous question "yes." Is the electrolyte level proper in all cells? Are all cells free of corrosion that would require immediate attention (Section 157-601-702)?

3.99 Examine the emergency and cell switches. Are the control rails clean (ie, do they provide good electrical contact surface)? Examine the shorting resistor used to carry the office load during the operation of the end cell switch. Is there evidence of cracking or other damage (discoloration is not a defect)? Are the gears lightly lubricated and without burns, and do contacts and clips engage smoothly (limited arch burns)? Are the resistors, gears, clips, and contacts satisfactory? Is the maximum current load within the current rating of the switches? Is the temperature of all parts of the switches and motors satisfactory (motor should be warm but not hot)? Have the voltage of the emergency end cells measured? Is the cell voltage within limits? Have the power plant put on discharge. Does the off-normal alarm

work, and does the switch actuate and return normally?

3.100 Inspect the dry cells and dry batteries used in the power room (ie, grid batteries, etc). Is the age of all the batteries (time since manufactured) within the limits specified in Tables A and B in Section 157-421-501? Are all the dry cells and dry batteries free of physical irregularities (ie, leaking electrolyte, bulging containers, or salt deposits)? Inspect the records of dry cell and dry battery voltage tests. Are voltage tests made of batteries with negligible current drain and variable current in accordance with BSPs.

3.101 Take several readings of the float voltage at the battery control panel during a heavy and a light traffic period. Does the average voltage divided by the number of cells indicate an individual cell voltage within limits (ie, 2.16V to 2.18V for low-gravity cells and 2.24V to 2.26V for high-gravity cells)? Does the voltage variation stay within required limits for the particular type rectifier (eg, less than ±0.2V for electronic regulators)? During the busy hour, have battery noise measurements made at four frames which supply talk and signal battery (eg, trunk relay frames, SF frames, carrier frames, signal equipment frames, repeater frames, radio frames, and amplifier frames). Have message noise measurements made as specified in Section 331-701-501, paragraph 3.01. Is the talk battery supply noise level on all sampled frames below the level requiring further analysis (less than 30 dBrnc)? Is the signal battery noise level below that requiring further investigation (55 dBrnc for 24V and 48V, 70 dBrnc for 130V)?

C. DC Power Plant (Motor-Driven Charging Generators)

3.102 Have all work routines for motor-driven charging units been scheduled and completed in accordance with the ETL, Section 155-001-016? Do the results shown on Form E-5453 or E-5454, Test and Inspection Summary, indicate a satisfactory preventive maintenance job (ie, work time reasonable, results consistent with actual conditions)?

3.103 Have the generators shut down in sequence so as to start each idle machine. Have each generator placed on "load." Are all generators available for service (eg, automatic plants not in stop position)? Examine the commutator of the idle generator; look for indications that the generators receive equal wear. Is a program in effect to equalize the wear of all generators? Is enough generating capacity provided so that at least one generator is idle during the busy hour? Is the output of operating generators at the correct voltage? Do the generators function properly (commutation, vibration, etc) during starting, running, and load transfer procedure?

3.104 Is the sparking between brush and commutator acceptable, and is there no sparking between brushes and collector rings? Do the commutators have a clean, smooth surface which is free from any discoloration other than the brown color (cuprous oxide) considered indicative of good commutation? Examine the commutator of each stopped motor generator. Are the commutators clean and free of surface deformation (ie, scoring, pitting, grooving, burning, etc) except that caused by normal wear? A chart depicting the various types of commutator surfaces is provided in Fig. 2 of Section 171-110-701.

3.105 Is the temperature of the bearing housings acceptable (not hot to touch)? Do the machines run without excessive noise or vibration?

3.106 Examine the CA contactor copper brushes and contactors which connect the motor generators to the office load (inside control unit). Are the copper brushes free of discoloration? Is the contactor free of excessive arc burns? Compare the current rating of the generator to the current rating of the circuit breaker; is adequate protection provided?

D. Rectifier and Converters (DC Power Plant)

3.107 Have preventive maintenance routines been scheduled and worked in accordance with the ETL?

3.108 Are all the rectifiers and converters available for service (eg, automatic plants not in stop position)? Have the office load transferred so as to cause all rectifiers and converters to be placed on load. Do all rectifiers and converters perform satisfactorily (output voltage correct, etc)?

3.109 Are all rectifier and converter alarms functioning in the proper manner?

E. AC and Frequency Supply Power Plant (Motor-Driven Alternators)

3.110 Have preventive maintenance routines been scheduled and worked in accordance with the ETL (Sections 163-001-013 and 163-001-018)?

3.111 Inspect the alternating current machines. Are the machines free of oil leaks and excessive vibration and temperature? Are the commutators slip rings and brushes in satisfactory condition?

3.112 Ask for both manual and automatic transfer of the alternating current machines. Is the standby machine available, and was the transfer and return to normal successful? Are the output voltages of all the alternating current machines within limits?

3.113 Inspect the frequency supply generators. Are the generators free of loose wires, excessive temperature, dust, and dirt? Are all the covers properly installed? Are all the controls clearly marked and emergency instructions clearly posted?

3.114 Ask for both manual and automatic transfer of the frequency generators. Is the backup supply operational and of adequate capacity and correct vintage? Are the output frequencies of each generator within limits? Have them checked. Are the approved frequency counters available? Has the frequency counter been calibrated within the prescribed interval?

F. AC Power Services

3.115 Is a record kept of power failures to provide an office history? Is the incidence of commercial power failures acceptable? Is a list of contacts in the power company readily available and posted for emergencies?

3.116 Are all lamps provided for emergency lighting in the power room in working condition? Is a clear, simple diagram of the ac power distribution taped on or posted near the power distribution board? Do the instructions tell the personnel what switch to throw, the sequence of operation, and what the switch controls?

3.117 Ask if a total power failure simulation will affect any equipment used for service. If it will, do not simulate a failure but answer the next three questions "no." If there is no problem, have a total power failure simulated, thereby causing the emergency dc-to-ac converter to be activated (Section 167-670-301). Did all audible and visual alarms actuate? Did all motor generators and rectifiers continue to function properly? Check the output voltage of the converter. Does the converter output meet specifications detailed in the BSP? Have the routines specified in the ETL (Section 167-001-017) been scheduled and the work completed as scheduled?

G. Safety

3.118 Are chemical agents for neutralizing battery acid readily available? Are gloves, apron, and goggles conveniently available in the battery area? Is the battery work area free of hazards (eg, spark-producing equipment, inadequate ventilation)?

3.119 Are insulating gloves for electrical protection conveniently available, currently dated, and stored properly? Test the rubber gloves for air leaks and cracks. Are the gloves in satisfactory condition? Are fuse pullers provided for removing fuses?

3.120 Is the storage of oily rags and other combustible items proper? Are fire extinguishers strategically provided? Are all extinguishers currently dated?

3.121 Is a gas indicator ready for use (ie, fresh batteries and calibration ampuls) for testing the cable vaults? Are all cable ducts properly sealed?

H. Air Dryers—For Waveguides and Cable Pressurization

3.122 Have preventive maintenance routines been scheduled and worked in accordance with the ETL? Do the humidity and pressure/flow rate alarms operate at the prescribed values?

3.123 Are backup air dryers available in the event of a failure? Are quick connections provided for both supply and air lines for the backup air dryers? How much time would elapse from a failure to the turnup of a backup air dryer? Would any service impairment occur?

3.124 Are air dryer pressure flow rate readings recorded properly and appropriate action taken when trouble indications are observed?

I. General Items

3.125 Is the general cleanliness of the power room and cable vault satisfactory? Are tools, parts, and supplies stored properly?

3.126 Examine the fuses at the Battery Distributing Fuse Board (BDFB) in the power room and other equipment locations (see the 500 series drawings for locations). Are spare fuses provided for all types of fuses? Touch a sample of the load-carrying fuses on the power board (particularly main discharge, carrier and toll fuses); examine the solderless connections for tightness. Are all fuse temperatures satisfactory, connections tight, and are fuse clips free of oxidation? Do all sampled fuses meet the load specified at the fuse holder, and are flashtype fuses used only when required?

3.127 Is at least one man on each shift trained on all emergency power procedures? Are training records maintained about the individual's power training? Are enough craftpeople available who are trained to clear trouble in power plant control equipment.

3.128 Are all cables properly bonded and grounded? Is the central office ground connected to the cold water pipe on the street side of the water meter, and are the ground conduits grounded?

3.129 Are voltmeters and ammeters properly calibrated and tagged with the date of calibration?

3.130 Do order-wire/alarm bays contain the appropriate logs and are they current? Are there any observable or indicated operation deficiencies with these order-wire/alarm bay circuits?

SPECIAL VERIFICATION ITEMS

A. Digital Transmisson Systems

General

3.131 This section provides a means to evaluate digital transmission equipment and records within the Central Office. Forms E-6984 (pages 1 through 5), E-6985, E-6986, and E-6987 are provided for the evaluator to record the results of test and inspection items. All exception items are to be referred to the appropriate level of management for corrective action.

3.132 The special verification items for Digital Transmission Systems are covered in the following nine sections: (1) T-Carrier Systems Record Cards, (2) D-Type Channel Banks and Channel Bank Bays, (3) Carrier Group Alarms (CGA), (4) T-Carrier Repeaters, Repeater Bays and DSX Bays, (5) Cross-Connects—Repeater and Terminal, (6) Maintenance, Backbone, and Powered Unassigned Lines, (7) Span Line Patching, (8) Central Office Alarms, and (9) Communications Equipment for T-Carrier Systems Installation and Maintenance.

3.133 This section establishes fixed minimum sample sizes for some items to be checked. Where minimum sample sizes are not specified, the procedures outlined in Section 010-300-010 for establishing a scientific sample size should be used.

3.134 The evaluator will record the results of the special verification items for Digital Transmission Systems on the checking list, Form E-6984, pages 1 through 5. These sheets provide space for digital equipment profiles, rating items, and for noting information pertaining to deviations. The results recorded on the above checking list are to be summarized on Form E-5126.

T-Carrier Systems Record Cards

3.135 Examine the T-Carrier office record cards and files. Are the following records current, legible, and filed in a logical manner?

(1) T-Carrier System Layout Record, Form E-4940, (2) T-Carrier Span Line Record, Form E-4941, (3) T-Carrier Span Line Repeater Case Record, Form E-4942, and (4) T-Carrier Terminal Trouble Record. References: Sections 365-000-010, 365-110-501, 365-116-505, and 365-150-505.

D-Type Channel Banks and Channel Bank Bays

3.136 Check the terminal record cards, Form E-4944, for D1 channel banks, Form E-5968 for D2 channel banks, Form E-6325 for D3 channel banks, and compare a minimum of 25 individual

channel designations from 5 or more different terminal record cards against the trunk or special service record cards. Is the proper terminal record card placed and are channels designated correctly for all D-type channel banks? Reference: Section 365-000-010.

3.137 Check the location and wiring of the equalizer or pad used in the transmit path of each D channel bank. Special attention should be given those D channel banks wired to bank terminating assembly (BTA). SD-97080-01. Is the transmit equalizer or pad for the D channel bank wired correctly? References: Sections 365-102-500, 365-116-501, 365-150-100, and 365-402-500.

3.138 Check to see if "Hot Maintenance" channel banks have been assigned for in-service D1A, D1B, and D1D-type channel banks. Is at least one looped "Hot Maintenance" channel bank provided per floor for each D1A, D1B, D1D-type channel bank? If "Hot Maintenance" channel banks have ***not*** been assigned, a request should be initiated by the evaluator to the appropriate organization to provide them. Reference: Section 855-350-108.

3.139 Check testboards and test circuits used to do initial and overall system and channel lineups, eg, Match Network (J98711M), PAM DET Board (4019R), Channel Access Unit—CAU (J98718AJ), etc. Are D-type channel bank testboards and test circuits calibrated and in satisfactory condition? References: Sections 365-103-100, 365-103-103, 365-103-500, 365-150-100, 365-150-501, 365-400-100, and 365-400-108.

3.140 Examine a minimum of 20 assigned channel units from each of the D-type channel banks in the office. (Note: D2, D3, and some D1 channel units require circuits to be removed from service before verifying options.) Are channel unit options correct? See appropriate SD or BSP for channel unit type. Unless specific circuit requirements are given, are NBOC options in 2-wire channel units selected to give minimum capacitance? Use Form E-6986 as a work sheet to record results of individual channel option inspections. References: Sections 365-110-500, 365-116-505, 365-150-505, and 365-410-500.

3.141 Check D1B and D1D converted channel banks for K wiring option (List 7 channel bank bays or earlier), appropriate plug-ins, and required CGA modification (D1D only). Are D1B and D1D channel bank conversions completed properly? References: SD-97060-01, Section 365-116-501, and GL 70-05-155.

3.142 Examine fuses that feed power to the channel banks. Are bank fuses cool to the touch (no signs of heating or overloading)? Are spare fuses readily available?

Carrier Group Alarms (CGA)

3.143 Check carrier group alarms and sample a minimum of 20 trunk and special service channel CGA options from each of the associated D-type channel bank carrier group alarms. D3 CGAs are called Trunk Processing Units (TPU) and are mounted with the common bank equipment.

> ***Note:*** D2 and D3 channel units must be removed from the channel bank to verify CGA options. Individual trunk and special service circuits must be taken out of service before verifying options.

Are all CGAs equipped with message registers? Are register readings being recorded to determine individual system performance? Have corrective maintenance procedures been initiated for the poorest performing systems? Are CGA options correct for the type of circuit assigned? Are make busy jumpers wired correctly at the distributing frame for outgoing trunks? Use Form E-6986 as a work sheet to record results of individual CGA option and make busy jumper inspections. References: Sections 365-001-011, 365-108-101, 365-108-102, 365-150-503, 365-400-107, SD-97093-01, SD-98084-01, SD-99478-01, and SD-3C104-01.

T-Carrier Repeaters, Repeater Bays, and DSX Bays

3.144 Examine repeater bay record cards, repeater designations, DSX panel record cards, and DSX panel designation cards. Are repeater bay record cards placed and filled out properly? Are assigned repeaters designated clearly? Are DSX panel record cards placed and filled out properly? Are DSX panel designation cards placed and filled out properly? References: Sections 365-000-010, 365-226-500, 365-301-101, and 365-301-102.

3.145 Check to see if an adequate number of quasi-random signal sources (QRSS) are provided at repeater or DSX locations. Is QRSS used to provide signals to idle maintenance lines,

idle backbone lines, and powered unassigned lines? References: Sections 103-493-104 and 855-351-101.

3.146 Check to see if bridging repeaters are provided for all maintenance lines. Are bridging repeaters cross-wired to QRSS? Are bridging repeaters cross-wired to maintenance lines to provide a permanent pulse when the maintenance line is not in use? Reference: Secton 365-224-500.

3.147 Span line power and error tests should be performed in advance of the evaluation on all span lines powered with constant current type regulators using Form E-6985 to document individual test results. Power tests are required only on those span lines being powered from the office being evaluated. (Note: If recent [within 1 year] span line power test results are available, there is no need to perform these tests again. Verify that a plan to correct deviations has been established.) At the time of the evaluation, span lines powered from 201-type office repeater bays are to have power and error tests performed. Are span line power readings within test requirements? Do powered span lines have acceptable error rates? References: Sections 365-223-500, 365-224-600, 365-225-500, and 365-271-000.

3.148 Examine order-wire circuit appearances and equipment. Perform operational tests from the T&R appearance on the MDF for those circuits providing dial tone to the line. Use Form E-6987 to document individual order-wire circuit test results. Are order-wire circuits providing dial tone operating properly? Are order-wire circuits extended to or located in the DSX bays? References: Sections 365-224-600, 365-271-000, 365-301-101, 365-301-102, 365-320-100, 365-500-107, and 855-350-107.

3.149 Check fault locate line appearances and verify that fault locate lines are properly terminated and in working condition by performing operational checks. Use Form E-6987 to document individual fault line results. Are fault locate lines identified clearly? Are fault locate lines operating properly? Are fault locate lines extended to or located in the DSX bays? References: Sections 365-200-160, 365-224-500, 365-225-500, 365-271-000, 365-301-101, 365-301-102, and 365-500-504.

3.150 Examine repeater bays, repeaters and repeater power units. Use Form E-6987 to document individual results. Physical power option checks should be performed on powered unassigned lines and idle maintenance lines to avoid interrupting service. Are repeater bays, repeaters, and repeater power units fused properly? Are fuses cool to the touch (no signs of heating or overloading)? Are spare fuses readily available? Are span line power options correct? Is "P" option turned two full turns counterclockwise on 206B and F repeaters when used with 178V or 260V line powering? Is "S" option in the 206 repeater power distribution circuit removed when the power feed voltage is 260V? References: Sections 365-223-500, 365-224-600, 365-271-000, and GL 72-10-143.

Cross-Connects—Repeater and Terminal

3.151 Check the wire cross-connects that are required to connect systems through the office, eg, ABAM, shielded, bay, span, and bank. Are wire cross-connects run properly and free of congestion? Are interbay cable ducts free of congestion? Is stenciling associated with the cross-connect fields or DSX panels clearly marked? References: Sections 069-120-801, 365-200-100, and 365-301-101.

Maintenance, Backbone, and Powered Unassigned Lines

3.152 Check maintenance, backbone, and powered unassigned lines. Are maintenance and backbone lines available to restore faulty repeatered lines? Are backbone lines accessible from all patching locations in the office? Are idle maintenance and backbone lines terminated properly? Are powered unassigned lines terminated properly? References: Section 365-224-500 and 365-271-000.

Span Line Patching

3.153 Check all locations where span line patches could be placed. Are all span line patches tagged using Form E-5132 and logged on Form E-6881? Are span line patches referred to the appropriate organization to repair their trouble condition? Is there a substantial quantity of approved patch cords available at patching locations to restore span line failures? Are bridging repeaters always used to patch failed or marginal span lines? Are all span line patches made at the DSX location? Are interbay patch trunks adequate and identified clearly? Do patches meet individual cord length restrictions? Do patches involving interbay patch trunks consist of only two patch cords and one

interbay patch trunk per patch? Are patches cleared within a reasonable time period? References: Sections 190-200-001, 365-020-301, 365-226-500, 365-271-000, and 365-301-101.

Central Office Alarms

3.154 Check audible and visual fuse alarms associated with the various types of T-Carrier equipment by placing the proper tools into the fuse holder to be tested. Use Form E-6987 to document individual results at T-Carrier repeater bays. Do audible and visual fuse alarms operate properly? Are audible and visual alarms easily detected by craft personnel? Are alarms out of the normal manned business day transferrred to a 24-hour manned maintenance center? Reference: Division 201, layer 6.

Communications Equipment for T-Carrier Systems Installation and Maintenance

3.155 Examine the telephone communications facilities available to the craft personnel to install and maintain T-Carrier equipment. Telephone communications equipment should be located in terminal, repeater, and DSX locations. Are telephone facilities adequate throughout the T-Carrier equipment aisles? Reference: Section 855-351-101.

4. POST-EVALUATION REVIEW MEETING AND REPORTS

REVIEW MEETING

4.01 On completion of the evaluation, a meeting should be held to review the findings of the evaluator with local and district management. This meeting is a vital part of the Plan and should not be omitted. If sufficient time is not available to hold the meeting at the conclusion of the evaluation visit, it should be rescheduled. Where several entities share common power plants, distributing frames, etc, they may be reviewed together.

4.02 The evaluator should make available blank copies of the checking lists for Central Office Evaluation on which local supervisors may note the findings of the evaluator as he reviews his notes. The review meeting should stimulate local supervision to initiate corrective action, where necessary, and should present an excellent educational opportunity.

REPORTS

4.03 Form E-5126, Summary of Central Office Evaluation—Trunks and Special Services, will be prepared from ratings and comments recorded on Forms E-5125, E-4979, E-4979-4, and E-6984.

4.04 Form E-5126 provides a common document for recording the results of evaluations contained in Part 3 of this Plan.

4.05 It is not the intent of this Plan that the qualitative results of several supervisor groups be combined. The evaluator's qualitative rating should be based on the evaluator's personal overall assessment of each section. A space is provided for brief comments about each exception item. The evaluator should comment on any sections that have either unsatisfactory or outstanding ratings.

4.06 Completed copies of Forms E-5125, E-5126, E-4979, E-4979-4, and E-6984 should be distributed in accordance with company policy.

4.07 It is intended that the evaluation scheme used in this Plan will provide middle and upper management with specific identification of areas in need of further action. Local management personnel should use the detailed analysis provided on the forms to develop a plan of action for correcting the deficiencies revealed by the evaluation.

FORM E-4979-TA
(1-77)

CHECKING LIST FOR CENTRAL OFFICE EVALUATION
(TRUNKS AND SPECIAL SERVICES – POWER EQUIPMENT REVIEW)

OFFICE _____ DISTRICT _____ DIVISION _____
EVALUATOR _____ DATE OF EVALUATION _____
SUPERVISOR _____ TYPE EMERGENCY ENGINE _____
POWER PLANT CAPACITY _____ POWER PLANT LOAD _____

EMERGENCY ENGINE	SATISFACTORY	EXCEPTION ITEM
(a) Are engine operating instructions available within view of starting controls?		
(b) Do operating instructions provide simple, clearly defined, step by step procedure?		
(c) Is adequate emergency lighting provided in the engine area?		
(d) Are adequate safety devices provided for eye and ear protection?		
(a) Does the engine run log provide a complete continuing record of engine runs?		
(b) Has the engine been run at prescribed minimum frequency intervals?		
(c) Does the duration of the engine run meet requirements?		
(d) Does the performance data indicate the machines are running properly?		
(a) Are all emergency engines operable and available for service?		
(b) Are the posted starting instructions followed and are they correct?		
(c) Are enough personnel qualified to start the emergency engine and connect the office load?		
(d) Is the exhaust free of leaks?		
(e) Is an adequate supply of "outside" air provided to the engine?		
(f) Does the engine run free of serious oil or water leaks?		
(g) Does the machine run within predetermined maximum and minimum limits?		
(a) Can portable engines be connected quickly and is the method clearly described?		
(b) Does the method of connection avoid violation of building security?		
(a) Is the starting mechanism for each engine adequately maintained?		
(b) Are all of the automatic shutdown and alarm features checked at prescribed frequencies?		
(c) Is an emergency shutdown switch provided at a safe location?		
(a) Is the oil lube level proper and changed or analyzed at proper interval?		
(b) Is the oil free of water drops?		
(c) Have air, fuel, and oil filters been changed at prescribed intervals?		
(d) Are antifreeze and rust inhibitor used in coolant water when required?		
(e) Is the fuel supply adequate?		
(f) Has fuel oil additive (inhibitor) been used and a check for water been conducted?		

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(BACK)

	SATISFAC-TORY	EXCEPTION ITEM
(a) Are adequate instructions provided for guidance should the engine fail to operate?		
(b) Are basic emergency tools kept on hand?		
Comments:		
BATTERIES		
(a) Have weekly voltage and six week specific gravity readings on pilot cells been recorded?		
(b) Are pilot cell voltage readings within limits?		
(c) Do the pilot cell specific gravity readings meet requirements?		
(d) Has proper action been taken when voltage or gravity deviations occur?		
(a) Have individual cell voltage readings been made as required for the last year?		
(b) Are individual cell voltage readings currently above minimum levels?		
(a) Have semi-annual individual cell specific gravity readings been completed?		
(b) Is the specific gravity of all cells within limits?		
(c) Has the variation of specific gravity of all individual cells remained constant within limit?		
(d) Were all individual cells brought to acceptable levels after the last charge?		
(a) Have quarterly battery inspections been completed and recorded for the last year?		
(b) Are deviations eliminated or being eliminated?		
(c) Is the water, used to replace evaporated water low in mineral content?		
(d) Is the power room ambient-temperature between 65 F and 85 F?		
(a) Are sample cell discharge tests made when required?		

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(1-77)

CHECKING LIST FOR CENTRAL OFFICE EVALUATION
(TRUNKING AND SPECIAL SERVICES POWER EQUIPMENT REVIEW)

BATTERIES (Cont.)	SATISFACTORY	EXCEPTION ITEM
(a) Are all cells free of physical defects?		
(b) Are all observed defects noted on the quarterly inspection record?		
(c) Is the electrolyte level proper in all cells?		
(d) Are all cells free of corrosion that would require immediate attention?		
(a) Do the control rails provide good electrical contact surface?		
(b) Are the resistors, gears, clips and contacts satisfactory?		
(c) Is the maximum current load within the current rating of the switches?		
(d) Is the temperature of the switches and motors satisfactory?		
(e) Are the emergency and cell voltages within limits?		
(f) Do the off-normal alarms work and the switches actuate and return normally?		
(a) Is the talk battery supply noise level below the level requiring immediate action?		
(b) Is the talk battery supply noise level below the level requiring further analysis?		
(c) Is the signal battery noise level below that requiring further investigation?		
(a) Is the age of all dry cells and dry batteries within limits?		
(b) Are all dry cells and dry batteries free of physical irregularities?		
(c) Are voltage tests made on dry batteries?		
(a) Does the average float voltage indicate individual cell voltage is within limits?		
(b) Does the regulator voltage variation stay within proper limits?		
Comments:		

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(BACK)

DC POWER PLANT (Motor – Driven Generators)	SATISFACTORY	EXCEPTION ITEM
(a) Have all work routines for motor driven charging units been scheduled and completed?		
(b) Do results of T and I orders indicate a satisfactory preventive maintenance job?		
(a) Are all generators available for service?		
(b) Is a program in effect to equalize the wear of all generators?		
(c) Is enough generating capacity provided so that at least one generator is idle during busy hour?		
(d) Is the output of operating generators at the correct voltage?		
(e) Do the generators function properly?		
(a) Is the sparking between brush and commutator acceptable?		
(b) Do commutators have clean surface free from improper discoloration?		
(c) Are the commutators free of surface deformation?		
(a) Is the temperature of the bearing housing acceptable?		
(b) Do the bearings run without excessive noise or vibration?		
(a) Are the CA contactor copper brushes free of discoloration?		
(b) Is the contactor free of excessive burns?		
(c) Does the circuit breaker provide proper current protection?		
Comments:		

E-4979-TC
(1-77)

CHECKING LIST FOR CENTRAL OFFICE EVALUATION (TRUNKING AND SPECIAL SERVICES/POWER EQUIPMENT REVIEW)

RECTIFIERS AND CONVERTERS (DC POWER PLANTS)	SATISFACTORY	EXCEPTION ITEM
(a) Have preventive maintenance routines been scheduled and worked?		
(a) Are all the rectifiers and converters available for service?		
(b) Do all rectifiers and converters perform satisfactorily? Alarms?		
Comments:		
AC AND FREQUENCY SUPPLY POWER PLANTS (MOTOR DRIVEN ALTERNATORS)		
(a) Have preventive maintenance routines been scheduled and worked?		
(a) Are the machines free of oil leaks and excessive vibration and temperature?		
(b) Are the commutators and brushes in satisfactory condition?		
(a) Is the standby plant available and the transfer and return successful?		
(b) Are the outputs of all machines within limits?		
Comments:		

E-4979-TC
(BACK)

AC POWER SERVICE	SATISFACTORY	EXCEPTION ITEM
(a) Is a history record of power failures kept?		
(b) Is the incidence of power failures acceptable?		
(c) Is a list of power company contacts readily available?		
(a) Are all emergency lights in the power room in working condition?		
(b) Is a clear simple diagram of AC power distribution taped or posted?		
(c) Do the instructions provide the craft people a clear, detailed procedure for operating AC switches?		
(a) During total power failure simulation, did audible and visual alarms actuate?		
(b) Did all generators and rectifiers continue to function properly during power failure test?		
(c) Does the converter output meet specifications detailed in the BSP?		
(d) Have the routines specified in ETL been scheduled and completed?		
Comments:		

SAFETY		
(a) Are chemical agents for neutralizing battery acid readily available?		
(b) Are gloves, apron, and goggles conveniently available in the battery area?		
(c) Is the battery work area free of hazards?		
(a) Are rubber gloves for electrical protection conveniently available and current?		
(b) Are the gloves in satisfactory condition?		
(c) Are fuse pullers provided for removing fuses?		
(a) Is the storage of oily rags and other combustibles proper?		
(b) Are fire extinguishers strategically provided?		
(c) Are all extinguishers currently dated?		
(a) Is a gas indicator ready for use for testing the cable vault?		
(b) Are all cable ducts properly sealed?		
Comments:		

E-4979-TD
(1-77)

CHECKING LIST FOR CENTRAL OFFICE EVALUATION
(TRUNKS AND SPECIAL SERVICES – POWER EQUIPMENT REVIEW)

AIR DRYERS, FOR WAVE GUIDES AND CABLE PRESSURIZATION	SATISFACTORY	EXCEPTION ITEM
(a) Have all the preventive maintenance routines been performed in accordance with the ETL's?		
(b) Do humidity and pressure/flow rate alarms operate at the prescribed values?		
(c) Are backup air dryers with quick connections provided?		
(d) Are air dryer pressure and flow rates recorded properly and appropriate action taken?		
Comments:		

GENERAL ITEMS		
(a) Is the general cleanliness of the power room and cable vault satisfactory?		
(b) Are tools, parts, and supplies stored properly?		
(a) Are spare fuses provided for all type fuses?		
(b) Are all sampled fuse temperatures satisfactory and connections tight?		
(c) Do all sampled fuses meet the load specified at the fuse holder?		
(a) Are enough men trained on all emergency power procedures?		
(b) Are training records maintained about individual's power training?		
(c) Are enough men available to clear trouble in power control equipment?		
(a) Are preventive maintenance routines for cable pressurization equipment scheduled and completed?		
(b) Are all cables properly bonded and grounded?		
(c) Is the central office ground connected properly?		
(a) Are voltmeters and ammeters properly calibrated and tagged?		
Comments:		

FORM E 4979-4TA
(1-77)

CHECKING LIST FOR CENTRAL OFFICE EVALUATION

(Trunks & Special Services – Distrubuting Frame)

OFFICE_____ DISTRICT_____ DIVISION_____

EVALUATOR_____ DATE OF EVALUATION _____

SUPERVISORS NAME_____ NO. OF FRAME PERSONNEL _____

FRAME SIZE: NO. OF VERTICALS_____ NO. OF CIRCUITS SERVED-TRUNKS_____ S.S._____

	Satis-factory	Exception Item
TROUBLE CONTROL **CIRCUIT ORDER TROUBLE DUE TO FRAME ACTIVITY**		
(a) Are all frame trouble reports logged in the Control Record (E5497)?		
(b) Are realistic objectives established on the Frame Control Record?		
(c) Are realistic objectives being met?		
(d) Is the frame trouble rate satisfactory?		
(e) Are all frame trouble reports reviewed by the supervisor?		
(f) Are work errors kept by individual craft people?		
(g) Has supervisor identified problem areas of frame activity?		
(h) Are controls effective in controlling or reducing worker errors?		
CIRCUIT ORDER DISCREPANCIES		
(a) Are all discrepancies logged on the Circuit Order Log (E5495)?		
(b) Is the discrepancy rate less than 5 percent of the activity items?		
(c) Is log used to identify source of discrepancy?		
(d) Does the supervisor actively work toward reducing discrepancies?		
COMMENTS:		
WORK ORDER COMPLETION CONTROL **CIRCUIT ORDER PROCESSING**		
(a) Is the flow of orders efficient?		
(b) Are orders adequately screened prior to working the order?		
(c) Are work items processed in an efficient manner?		

FORM E 4979-4TA
(BACK)

	CIRCUIT ORDER PROCESSING INTERVAL	Satis-factory	Exception Item
(a)	Are the bulk of the frame items usually prebuilt?		
(b)	Are all the sampled orders prebuilt?		
(c)	Are sampled orders processed and sent to the frame in a satisfactory time interval?		
(d)	Is a "Bulk" order log (Form E-5498) established?		
	CIRCUIT ORDER COMPLETION TIMES		
(a)	Were all sampled "first" orders completed correctly and within the proper time?		
(b)	Is the completion time of "go-ahead" orders satisfactory?		
	CIRCUIT ORDER FILING		
(a)	Is the filing system simple and easy to use?		
(b)	Can pending work, due date changes, and completed work be identified?		
(c)	Are all completed orders made available to supervisor for checking?		
(d)	Does the supervisor sample and initial completed circuit orders?		
(e)	Is there unnecessary duplication of filing and dispatching?		
	CIRCUIT ORDER LOG		
(a)	Are delays, discrepancies, and other problems recorded on a log (E-5495)?		
(b)	Is log comprehensive enough for subsequent use by management?		
(c)	Is time recorded when troubles are encountered and cleared?		
(d)	Is the time to clear discrepancies satisfactory?		
(e)	Are only orders requiring follow-up and co-ordination recorded on the log?		
	BULK TRANSFER ORDER CONTROL		
(a)	Is a log established to summarize the status of "bulk" transfer orders (Form E-5498)?		
(b)	Is the time to complete individual bulk orders estimated by the supervisor?		
(c)	Are uncompleted bulk orders less than one month old?		
(d)	Have bulk order pullouts been completed in reasonable time?		
(e)	Are bulk orders updated with circuit order activity in a timely manner?		
(f)	Have all due dates been met on all facility "roll" orders for the last month?		
COMMENTS:			

CHECKING LIST FOR CENTRAL OFFICE EVALUATION

FORM E 4979-4TB
(1-77)

(Trunks & Special Services – Distributing Frame)

	TRUNK AND SPECIAL SERVICE ORDERS	Satis-factory	Exception Item
(a)	Is the Trunk and Special Service Log (E-5495) used to provide a status summary?		
(b)	Are due dates met and pull outs completed on these type orders?		
(c)	Is a sketch available to assist the frame people on the sampled orders?		
(d)	Are all entries on the sampled orders complete and accurate?		
	SERVICE PROTECTION PROCEDURES (Excluding SSM/SSP)		
(a)	Does the supervisor train the frame personnel on proper testing procedures?		
(b)	Are working circuits monitored prior to cutting the jumper or shorting lines for the testboard?		
(c)	Are circuits to be disconnected or transferred verified prior to cutting?		
(d)	Are all wiring steps verified upon completion of the order?		
(e)	Is an effective test procedure enforced and proper caution used?		
(f)	Are insulated soldering iron tips used exclusively?		
(g)	Is the whole frame properly coiled-up?		
(h)	Is a log maintained of work directed by testboard?		
(i)	Are all temporary shoes removed in an acceptable time period?		

COMMENTS:

FORM E 4979-4TB
(BACK)

PRODUCTION CONTROL TIME STUDY	Satis-factory	Exception Item
(a) Has a time study been made to compute average (raw) time to run and disconnect cross connections during the past 12 months (E-5924)?		
(b) Does the study have statistical validity?		
(c) Do the raw time estimates seem reasonable?		
SERVICE ORDER ACTIVITY STUDY		
(a) Was a study made to determine the number of jumpers required for the various type work orders and the EJ's for recurring work items (E-5958)?		
(b) Is the frequency of updating such studies in accordance with company objectives?		
PRODUCTION DETERMINATION		
(a) Does the production report include all hours expended for the frame job (E-5926)?		
(b) Do the total hours approximately equal the number of frame personnel?		
(c) Has the supervisor determined how many frame items are worked during a given time period and the EJ/hr rate?		
(d) Has the supervisor used the EJ/hr rate to estimate man hours required to complete the day's work load?		
(e) Has the supervisor identified the hours used to perform major frame duties?		
PRODUCTION PERFORMANCE		
(a) Is the production performance trended (E-5957) by the supervisor?		
(b) Is the frame productivity trend showing improvement?		
(c) Does the supervisor adjust the size of the work force for adequate control of productivity?		
(d) Is necessary-productive "fill-in" work provided and immediately available?		
(e) Has the supervisor established realistic production objectives?		
EFFECTIVENESS OF LOAD FORECASTING		
(a) Does the supervisor make contact with other "input" force supervisors to forecast load?		
(b) Does the supervisor know what his busiest days are?		
(c) Is historical data used to forecast load (E-5495, E-5498, E-5958)?		
(d) Has the supervisor estimated the man hours needed for the next day and week?		
(e) Does the frame operation indicate the force is properly matched to the load?		
(f) Does the supervisor properly control the use of overtime?		
(g) Is the supervisor's work load forecast used to make manpower forecasts and budgets?		
COMMENTS:		

FORM E 4979-4TC
(1-77)

CHECKING LIST FOR CENTRAL OFFICE EVALUATION

(Trunks & Special Services – Distributing Frame)

PRODUCTION MAXIMIZATION	Satis-factory	Exception Item
(a) Are orders worked in bulk fashion whenever possible?		
(b) Does the supervisor estimate the work time when bulk work assignments are laid out?		
ROAD BLOCKS		
(a) Has the supervisor correctly defined major lost time problem areas?		
(b) Does the supervisor have an effective plan to correct these weak areas?		

COMMENTS:

GENERAL FRAME ADMINISTRATION ADMINISTRATIVE ROADBLOCK ELIMINATION		
(a) Are proper quantities of frame supplies conveniently available?		
(b) Are adequate spare tools and test gear available?		
(c) Are charts and diagrams provided to assist frame people with complex work?		
(d) Have equipment and facility charts been posted to assist frame people in locating terminals?		
(e) Does stenciling provide easy and accurate identification of cable pairs?		
(f) Is horizontal stenciling satisfactory?		

COMMENTS:

FORM E 4979-4TC
(BACK)

	WORK ASSIGNMENTS	Satis-factory	Exception Item
(a)	Are work assignments defined and assignments posted?		
(b)	Do work assignments provide flexibility for higher priority jobs?		
(c)	Is adequate supervisory control provided for all shifts?		
	ROUTINES		
(a)	Are frame routines scheduled and controlled in accordance with CMP?		
(b)	Have all major routines been completed in the last 3 months?		
	WORK ENVIRONMENT		
(a)	Is the frame professional in overall appearance?		
(b)	Is the atmosphere conducive to quality work and training?		
(c)	Is the frame free of jumper congestion problems?		
(d)	Is a formal program in effect to control and/or reduce shelf congestion?		
	SPECIAL PROTECTION		
(a)	Is BSP section 460-110-100 readily available in work area?		
(b)	Are craft people trained on local SSM/SSP procedures?		
(c)	Are adequate supplies of SSM/SSP protective devices available?		
(d)	Are all sampled SSM/SSP orders processed properly?		
(e)	Does the supervisor inspect most SSM/SSP work completed?		
	PRIORITY OF WORK		
(a)	Are appropriate work priorities established?		
(b)	Are frame people trained in priority of work?		
(c)	Does the frame provide adequate service to the LTD?		
(d)	Are contacts with TIRKS or CPB handled efficiently?		
COMMENTS:			

FORM E 4979-4TD
(1-77)

CHECKING LIST FOR CENTRAL OFFICE EVALUATION

(Trunks & Special Services – Distributing Frame)

		Satis-factory	Exception Item
	FRAME PERSONNEL DEVELOPMENT		
	WORK EVALUATIONS		
(a)	Have appropriate numbers of evaluations been done on every craft person for last 6 months (E-5492)?		
(b)	Is the number of evaluations greater for new frame people?		
(c)	Do the number of observation of work-in-progress equal observations after-the-fact?		
	SAMPLE EVALUATION		
(a)	Does the supervisor check that work is done according to BSP and local procedures?		
(b)	Was the work sampled satisfactory?		
	TRAINING		
(a)	Does the supervisor have and use an on-the-job training program (E-5459)?		
(b)	Are individual training records established and kept current (E-5491)?		
(c)	Is a complete set of "frame" BSP's available in the work area?		
(d)	Are new personnel familiar with correct procedures and adequately trained for job they are performing?		
COMMENTS:			
	SAFETY		
	SAFETY TRAINING		
(a)	Are safety meetings scheduled and conducted properly?		
(b)	Are records kept on safety training for each frame person (E-5491)?		
(c)	Is adequate safety training provided for all new frame people?		
(d)	Are frame personnel familiar with proper high voltage protection and fire fighting procedures?		
(e)	Are eye protection devices used in accordance with company policy?		
COMMENTS:			

FORM E 4979-4TD
(BACK)

SAFE WORKING CONDITIONS	Satis-factory	Exception Item
(a) Is the frame free of housekeeping hazards?		
(b) Are ladders free of hazards?		
(c) Are electrical tools free of hazards?		
(d) Are fire protection devices available and ready for use?		

COMMENTS:

FRAME EVALUATION SUMMARY	Satisfactory Items	Exception Items
Trouble Control		
Work Order Completion Control		
Production Control		
General Frame Administration		
Frame Personnel Development		
Safety		

COMMENT SUMMARY:

E-5124-1
(1-77)

TRUNKS AND SPECIAL SERVICES
PERFORMANCE INDICATORS

OFFICE_____ DISTRICT_____ DATE_____
OFFICE HEAD_____ NO. OF SUPERVISORS_____ NO. OF CRAFT_____

PRODUCTIVITY	PERIOD					
ACCOUNT –						
ACCOUNT –						
ACCOUNT –						
ACCOUNT –						
TOTAL OFFICE						
OVERTIME RATE						

No. of Controlled Trunks	Aux.	Local	T.C.	I.T.

TRUNK SERVICE RESULTS (E-3994)	PERIOD					
NUMBER OF TRUNKS						
REPEATED REPORTS						
AVERAGE OUTAGE HOURS						
TRUNK SERVICE INDEX						

TRUNK TRANSMISSION (E-4277) MAINTENANCE INDEX (E-5441)	PERIOD					
LOSS – E Reptr. and no Gain						
– Other Reptr. and Carrier						
– Component Index						
NOISE – % Msmts. Made						
– % Msmts. above Mtce. Limit						
– Component Index						
BALANCE CERTIFIED_____	Last Sample_____		Satisfactory_____		Unsatisfactory_____	

OTHER						

E-5124-2
(1-77)

TRUNKS AND SPECIAL SERVICES
PERFORMANCE INDICATORS

TELEPHONE (Special Services)	PERIOD					
Combined Index (100%)						
Reports						
Initial Customer (15%)						
Duration Time (10%)						
Clearing Time						
STC (20%)						
Local Plant (15%)						
Trouble Cases						
Index (40%)						
Serving Link						
STC						
Inter-STC						

TELEGRAPH (Special Services)	PERIOD					
Combined Index (100%)						
Reports						
Initial Customer (15%)						
Duration Time (10%)						
Clearing Time						
STC (20%)						
Local Plant (15%)						
Trouble Cases						
Index (40%)						
Serving Link						
STC						
Inter-STC						

OTHER (Special Services)	PERIOD					

E-5125-1
(1-77)

CHECKING LIST FOR CENTRAL OFFICE EVALUATION

(Trunks and Special Services)

OFFICE_____ DISTRICT_____

EVALUATOR_____ DATE OF EVALUATION_____

RESULTS AUDIT TRUNKS AND SPECIAL SERVICES – Do any of the following irregularities apply?	SATIS-FACTORY	EXCEPTION ITEM
(a) Minor non-recurring transcription error		
(b) Major non-recurring transcription error		
(c) Recurring transcription errors		
(d) Base measurement irregularity other than transcription error		
(e) Improper classification of one ticket		
(f) Improper classification of tickets which affect the service results		
(g) Minor non-recurring discrepancy in computations		
(h) Major non-recurring discrepancy in computations		
(i) Recurring discrepancy in computations		
(j) Other – Describe		

COMMENTS

PRODUCTION		
(a) Do time reports fail to correctly reflect work operations performed?		
(b) Do charges to the "R" and "M" Central Office accounts seem unreasonable?		
(c) Do charges to the unmeasured and undistributed account seem unreasonable?		
(d) Do charges to the "C" Central Office account seem unreasonable?		
(e) Are work orders falsely shown completed?		

COMMENTS:

E-5125-2
(1-77)

CHECKING LIST FOR CENTRAL OFFICE EVALUATION
(Trunks and Special Services)

PLANT MANAGEMENT INSTRUCTIONS	SATIS-FACTORY	EXCEPTION ITEM
WORK INVENTORY		
(a) Have all corrective and preventive maintenance hours been identified?		
(b) Do daily and demand type work hours seem reasonable?		
WORK ASSIGNMENTS		
(a) Do work assignments provide a measurable quantity of work that would be considered a good day's work?		
(b) Are the craftpeople working on their assigned duties?		
(c) Are work assignments productive and necessary?		
FORCE AVAILABILITY AND PUNCTUALITY		
(a) Were any exceptions observed when the check of force present and ready for work was made?		
ROAD BLOCKS		
(a) Does the supervisor have a continuing program to identify road blocks?		
(b) Is there a program to eliminate or reduce road blocks?		
CIRCUIT AND SERVICE ORDERS AND CROSS-CONNECTION WORK		
(a) Are order handling and processing procedures efficient?		
(b) Is the order filing systems simple and easy to use?		
(c) Were the required tests made on all sampled orders?		
(d) Is there documentation of test results and have exceptions been properly handled?		
(e) Is the supervisor aware of circuit order due dates and are controls established to meet these dates?		
(f) Do the hours expended doing frame work seem reasonable?		
(g) Do the number of frame personnel appear appropriate for the load?		
(h) Is the size of work force adjusted to handle the frame work load?		
(i) Are individual production records kept on frame personnel?		
(j) Does the frame job appear in order?		
WORK EVALUATION PROGRAM		
(a) Do the number of evaluations vary according to the persons experience?		
(b) Has an adequate number of evaluations been made on every person in the previous month?		
(c) Have a sufficient number been observations of work in progress?		
(d) Do all evaluation records contain remarks about quality and production?		
(e) Are work observations used to trigger personnel development?		
(f) Does the supervisor evaluate the job exactly as required by BSP or other applicable instruction?		
(g) Were the jobs evaluated done per BSP and the trouble cleared?		

E-5125-3
(1-77)

CHECKING LIST FOR CENTRAL OFFICE EVALUATION
(Trunks and Special Services)

	PLANT MANAGEMENT INSTRUCTIONS (CONT'D)	SATIS-FACTORY	EXCEPTION ITEM
	TRAINING		
(a)	Are both formal training and O.J.T. documented on the training record?		
(b)	Have enough personnel been trained to handle the normal work volume?		
(c)	Is there no evidence of over-training?		
(d)	Is formal training followed with on-the-job training and evaluation?		
(e)	Has a training program been established for each individual?		
(f)	Has the Plant School fulfilled this offices off-the-job-training needs?		
	FORECAST AND BUDGET		
(a)	Have Corrective and Preventive hours been identified in the forecast?		
(b)	Have the previous 6 months forecasts been within 5% of actual hours?		
(c)	Are deferred preventive maintenance hours less than one normal month's preventive work?		
(d)	Is the present force adequate to meet forecasted manpower requirements for the next 3 months?		
(e)	Is Form E-5468 or Company equivalent used and filled out?		
(f)	Has a supervisor's man-hour budget been established?		
(g)	Are R and M hour budget objectives being met?		
(h)	Is the use of overtime effective?		
(i)	Does the supervisor receive evidence (each day) of how craftpeople's time was spent?		
(j)	Does work record indicate what an individual accomplished and that it was done in reasonable time?		
(k)	Does the supervisor ascertain reason for work order time disparities?		
	SAFETY		
(a)	Are fire extinguishers, rubber gloves, and gas indicators satisfactory?		
(b)	Are all combustibles stored properly?		
(c)	Are the craftpeople knowledgeable about alarms and fire fighting procedures?		
(d)	Were no safety hazards observed?		
(e)	Were all personnel observed to be working safely?		
(f)	Are safety meetings scheduled and conducted regularly?		
	HOUSEKEEPING		
(a)	Are floors and equipment clean?		
(b)	Is it evident the craftspersonnel practice good housekeeping in their work procedures?		
(c)	Are storage arrangements for wire, test sets, plug-in equipment, etc. adequate?		
(d)	Are shipments of equipment and supplies processed properly?		

E-5125-4
(1-77)

CHECKING LIST FOR CENTRAL OFFICE EVALUATION

(Trunks and Special Services)

PLANT MANAGEMENT INSTRUCTIONS (CONT'D)	SATIS-FACTORY	EXCEPTION ITEM
BUILDINGS		
(a) Is the office free from building defects?		
(b) Is the temperature and humidity controlled at proper levels?		
(c) Are adequate controls in effect to assure prompt correction of building alarm conditions?		
SECURITY		
(a) Is the access to central office quarters controlled?		
(b) Are approved admission procedures followed?		
INSTALLATION ITEMS		
(a) Did the MOP contain service protection procedures and was it properly approved?		
(b) Was a test and analysis committee established and effective?		
(c) Were the controls effective in limiting service reactions?		
(d) Is there good working relationship between Telco supervisor and the installation supervisor?		
SUPPLIES, TEST SETS AND TOOLS		
(a) Are spare parts stocked in appropriate quantities?		
(b) Are supplies stocked in correct amounts?		
(c) Are only necessary test sets stocked in the office and other available on loan?		
(d) Are stocks of tools and supplies properly secured?		
F.C.C. REGULATIONS		
(a) Are current radio station licenses posted in approved manner?		
(b) Are appropriate radio station logs maintained?		
(c) Are log entries current?		
(d) Are maintenance personnel radio licenses posted?		
(e) Is list of maintenance personnel radio licenses posted at remote radio stations?		
(f) Are current issues of appropriate F.C.C. rules available?		

COMMENTS:

E-5125-5
(1-77)

CHECKING LIST FOR CENTRAL OFFICE EVALUATION
(Trunks and Special Services)

SERVICE RESULTS	SATIS-FACTORY	EXCEPTION ITEM
(a) Is the weakest component above a 95 Index?		
(b) Do basic records provide significant data to determine reason for performance?		
(c) Is it evident that the supervisor is aware of performance?		
(d) Have timely and effective control measures been implemented?		
(e) Are all other components above a 95 index?		
(f) Are work errors at an acceptable level?		
(g) Are service-performance indicators related to need for preventive maintenance?		
(h) Have all service-related equipment and facility troubles been included in the corr. mtce. analysis of CM?		
(i) Is there evidence of a coordinated effort of all supervisory groups to maintain and improve service?		
CONTROLLED MAINTENANCE (CONT'D) PREVENTIVE MAINTENANCE		
CONTROLLED MAINTENANCE IMPACT ON SERVICE RESULTS		
(a) Does the supervisor know how many trouble reports can be tolerated per day before service results drop below the satisfactory level?		
(b) Does the supervisor know the amount and area of Preventative Maintenance Application required to control trouble report volume low enough to insure satisfactory service results?		
COMMENTS:		

E-5125-6
(1-77)

CHECKING LIST FOR CENTRAL OFFICE EVALUATION
(Trunks and Special Services)

CONTROLLED MAINTENANCE CORRECTIVE MAINTENANCE	SATIS-FACTORY	EXCEPTION ITEM
TROUBLE TICKET		
(a) Are the trouble tickets legible and do they contain adequate information?		
(b) Are coding and filing of trouble tickets correct?		
(c) Is clearing and work time entries made on all tickets and is the time reasonable?		
(d) Has the supervisor checked all tickets?		
CENTRAL OFFICE LOG		
(a) Are ticket entries timely and correct?		
(b) Do entries on the log indicate a complete recording job?		
(c) Does the supervisor know the reason for all carried over tickets from the previous day?		
CONTROL RECORD		
(a) Are complete entries made on the Control Record daily?		
(b) Have reasonable trouble expectancy objectives been posted?		
(c) Has appropriate action been taken when posted trouble expectancies are exceeded?		
TROUBLE SUMMARY		
(a) Have all necessary entries been made and are they correct?		
TICKET FILE		
(a) Has appropriate action been taken to correct repeated troubles?		
TROUBLE TALLY		
(a) Has the use of the Trouble Tally or appropriate ticket analysis been correct?		

COMMENTS:

E-5125-7
(1-77)

CHECKING LIST FOR CENTRAL OFFICE EVALUATION

(Trunks and Special Services)

	CONTROLLED MAINTENANCE (CONT'D)	SATIS-FACTORY	EXCEPTION ITEM
	PREVENTIVE MAINTENANCE PROGRAM		
(a)	Has a test schedule been established for all applicable ETL tests?		
(b)	Have work times been established for each work item?		
(c)	Has the supervisor estimated total time to complete all work items?		
(d)	Are the supervisor's time estimates adjusted to actual time used?		
(e)	Are supervisor's time estimates used to establish the work schedule?		
(f)	Are deferred hours reported correctly?		
	TEST AND INSPECTION WORK ORDERS		
(a)	Are the job sizes reasonable and the tests arranged in efficient manner?		
(b)	Is the time recorded on all forms?		
(c)	Is the difference between actual and estimated work time acceptable?		
(d)	Did the supervisor demonstrate valid reasons for MR work decisions?		
(e)	Has the application of scientific sampling been correct?		
	AUTOMATIC TEST EQUIPMENT		
(a)	Are all automatic test frames operative?		
(b)	Are all automatic test frames used on a daily basis?		
(c)	Have the test frames been used productively?		
(d)	(No automatic test frame) Is portable test equipment functioning properly?		
(e)	Is automatic test frame data base up-to-date?		

COMMENTS

CHECKING LIST FOR CENTRAL OFFICE EVALUATION
(Trunks And Special Services)

E-5125-8
(1-77)

Manual Testing – Positions, Frames Boards	Satis-factory	Exception Item
Testing Equipment and Records		
(A) Are all circuit designations clear enough to prevent work errors?		
(B) Have all test sets been recalibrated within the prescribed intervals?		
(C) Is all supporting equipment (Cords, headsets, etc.) in good condition?		
(D) Are the appropriate individual circuit and facility records available at the test positions?		
Testroom Operations		
(A) Are incoming calls answered properly?		
(B) Are trouble indications and alarms answered promptly?		
(C) Are trouble tickets prepared promptly on all circuit troubles as they are reported?		
(D) Are circuits properly removed from service?		
(E) Are patch cords properly placed, tagged and dated?		
(F) Are patch cords left up for an extended period of time?		
(G) Do the craft personnel respond to, and escalate extended outage conditions to the supervisor?		
Test room Administration		
Does the supervisor have a clearly defined plan for:		
(A) – the escalation of extended outages?		
(B) – prompt restoral of priority circuit outages?		
(C) – securing message circuits to provide temporary restoral of special outages?		
(D) – handling restoral of trunk and special outages caused by major facility failures?		
(E) Are the testroom craft personnel familiar with these plans?		

COMMENTS:

CHECKING LIST FOR CENTRAL OFFICE EVALUATION
(Trunks And Special Services)

E-5125-9
(1-77)

Plug In Inventory Control System (PICS)	Satis-factory	Exception Item
(A) Are the appropriate PICS practices and forms available and properly stored?		
(B) Is there any defective plug-in found in storage?		
(C) Are defective plug-in units tagged properly and returned to the PICS coordinator the same day?		
(D) Are spare plug-in inventories clearly designated "Maintenance" or "Circuit Order"?		
(E) Based upon the local trouble rate history are there excessive maintenance spare plug-in units?		
(F) Based on the local circuit order activity history, are there excessive circuit order spare plug-in units?		
(G) Are any maintenance, circuit order, or non-designated spares found in plug-in mounting bays and frames?		
(H) Are returned plug-in units packaged in the approved manner to prevent damage in shipment?		
Comments:		

SUMMARY OF CHECKING LISTS

(Trunks and Special Services)

E-5126
(2-77)

Office _____ District _____ Division _____
Evaluator _____ Date of Evaluation _____
Supervisory Group(s) _____

TRUNKS AND SPECIAL SERVICES EVALUATION			
Evaluation Section	Satis-factory	Exception Item	Comments
Results Audit			
Plant Management Instructions			
Service Results			
Controlled Maintenance			
Corrective Maintenance			
Preventive Maintenance			
CM—Total			
Trunks And Special Services — Total			
Summary Comments			

POWER EQUIPMENT EVALUATION			
Emergency Engine			
Batteries			
DC Power Plant			
Rectifiers			
AC & Frequency Supply Plant			
AC Power Service			
Safety			
Miscellaneous			
Power Equipment Total			
Summary Comments			

(E-5126)
Back

FRAME EVALUATION			
Evaluation Section	Satis-factory	Exception Item	Comments
Trouble Control			
Circuit Order Completion			
Production Control			
Administration			
Personnel Development			
Safety			
Frame Total			
Summary Comments			

SPECIAL VERIFICATION ITEMS			
DIGITAL TRANSMISSION SYSTEMS			
T-Carrier Systems Record Cards			
D-Type Channel Banks And Channel Bank Bays			
Carrier Group Alarms			
T-Carrier Repeaters, Repeater Bays And DSX Bays			
Cross-Connects-Repeater And Terminal			
Maintenance, Backbone And Powered Unassigned Lines			
Span Line Patching			
Central Office Alarms			
Communications Equipment For T-Carrier Systems Installation And Maintenance			
Digital Transmission Systems Total			
Summary Comments			

CHECKING LIST FOR CENTRAL OFFICE EVALUATION

(E-6984-1)
(2-77)

(Trunks And Special Services – Special Verification Items)

Digital Transmission Systems

Office _____ District _____ Division _____
Evaluator _____ Date Of Evaluation _____
Supervisor _____

T-CARRIER SYSTEMS RECORD CARDS	Satis-factory	Exception Item
(a) Are the following records current, legible and filed in a logical manner?		
1. T-Carrier System Layout Record (E-4940)		
2. T-Carrier Span Line Record (E-4941)		
3. T-Carrier Span Line Repeater Case Record (E-4942)		
4. T-Carrier Terminal Trouble Record		

COMMENTS

D-TYPE CHANNEL BANKS AND CHANNEL BANK BAYS		
(a) Is the proper terminal record card placed and are channels designated correctly for all D-type channel banks?		
(b) Is the transmit equalizer or pad for the D channel banks wired correctly?		
(c) Is at least one looped "Hot Maintenance" channel bank provided per floor for each D1A, D1B, D1D type channel bank?		
(d) Are D type channel bank test boards and test circuits calibrated and in satisfactory condition?		
(e) Are channel unit options correct?		
(f) Unless specific circuit requirements are given, are NBOC options in 2-Wire channel units selected to give minimum capacitance?		
(g) Are D1B and D1D Channel bank conversions completed properly?		
(h) Are bank fuses cool to the touch (no signs of heating or overloading)?		
(i) Are spare fuses readily available?		

COMMENTS

CHANNEL BANK PROFILE: D1 _____ D2 _____ D3 _____ D4 _____

CHECKING LIST FOR CENTRAL OFFICE EVALUATION

(Trunks and Special Services — Special Verification Items)

(E-6984-2)
(2-77)

Digital Transmission Systems

CARRIER GROUP ALARMS (CGA)	Satis-factory	Exception Item
(a) Are all CGA's equipped with message registers?		
(b) Are register readings being recorded to determine individual system performance?		
(c) Have corrective maintenance procedures been initiated for the poorest performing systems?		
(d) Are the CGA options correct for the type of circuit assigned?		
(e) Are make busy jumpers wired correctly at the distributing frame for outgoing trunks?		
COMMENTS		
T-CARRIER REPEATERS, REPEATER BAYS AND DSX BAYS		
(a) Are repeater bay record cards placed and filled out properly?		
(b) Are assigned repeaters designated clearly?		
(c) Are DSX panel record cards placed and filled out properly?		
(d) Are DSX panel designation cards placed and filled out properly?		
(e) Is QRSS used to provide signals to idle maintenance lines, idle backbone lines and powered unassigned lines?		
(f) Are bridging repeaters cross-wired to QRSS?		
(g) Are bridging repeaters cross-wired to maintenance lines to provide a permanent pulse when the maintenance lines are not in use?		
(h) Are span line power readings within test requirements?		
(i) Do powered span lines have acceptable error rates?		
(j) Are order-wire circuits providing dial tone operating properly?		
(k) Are order-wire circuits extended to or located in the DSX bays?		
(l) Are fault locate lines identified clearly?		
(m) Are fault locate lines operating properly?		
(n) Are fault locate lines extended to or located in the DSX bays?		
(o) Are repeater bays, repeaters and repeater power units fused properly?		
(p) Are fuses cool to the touch (no signs of heating or overloading)?		

CHECKING LIST FOR CENTRAL OFFICE EVALUATION

(Trunks and Special Services – Special Verification Items)

Digital Transmission Systems

(E-6984-3)
(2-77)

T-CARRIER REPEATERS, REPEATER BAYS AND DSX BAYS	Satis-factory	Exception Item
(q) Are spare fuses readily available?		
(r) Are span line power options correct?		
(s) Is "P" option turned two full turns counterclockwise on 206B and F repeaters when used with 178V or 260V line powering?		
(t) Is "S" option in the 206 repeater power distribution circuit removed when the power feed voltage is 260 volts?		

COMMENTS

Office Repeater Profile: 201 _____ 206 _____ 208 _____ 220 _____
221 _____ 231 _____ 236 _____

CROSS-CONNECTS-REPEATER AND TERMINAL		
(a) Are wire cross-connects run properly and free of congestion?		
(b) Are interbay cable ducts free of congestion?		
(c) Is stenciling associated with the cross-connect fields or DSX panels clearly marked?		
(d) Is tinned, 3-pair twisted "Y1" cross-connect wire used for DSX-1 and DSX-1C cross connections?		

COMMENTS

CHECKING LIST FOR CENTRAL OFFICE EVALUATION

(E-6984-4)
(2-77)

(Trunks and Special Services – Special Verification Items)

Digital Transmission Systems

MAINTENANCE, BACKBONE AND POWERED UNASSIGNED LINES	Satis-factory	Exception Item
(a) Are maintenance and backbone lines available to restore faulty repeatered lines?		
(b) Are backbone lines accessible from all patching locations in the office?		
(c) Are idle maintenance and backbone lines terminated properly?		
(d) Are powered unassigned lines terminated properly?		

COMMENTS

Maintenance And Backbone Line Profile: ML _____ **BB** _____

SPAN LINE PATCHING		
(a) Are all span line patches tagged using form E-5132 and logged on form E-6881?		
(b) Are span line patches referred to the appropriate organization to repair their trouble condition?		
(c) Is there a substantial quantity of approved patch cords available at patching locations to restore span line failures?		
(d) Are bridging repeaters always used to patch failed or marginal span lines?		
(e) Are all span line patches made at the DSX location?		
(f) Do patches meet individual cord length restrictions?		
(g) Are interbay patch trunks adequate and identified clearly?		
(h) Do patches involving interbay patch trunks consist of only 2 patch cords and one interbay patch trunk per patch?		
(i) Are patches cleared within a reasonable time period?		

COMMENTS

CHECKING LIST FOR CENTRAL OFFICE EVALUATION

(E-6984-5)
(2-77)

(Trunks and Special Services – Special Verification Items)

Digital Transmission Systems

CENTRAL OFFICE ALARMS	Satis-factory	Exception Item
(a) Do audible and visual fuse alarms operate properly?		
(b) Are audible and visual alarms easily detected by craft personnel?		
(c) Are alarms out of the normal manned business day transferred to a 24 hour manned maintenance center?		

COMMENTS

COMMUNICATIONS EQUIPMENT FOR T-CARRIER SYSTEMS INSTALLATION AND MAINTENANCE		
(a) Are telephone facilities adequate throughout the T-Carrier equipment aisles?		

COMMENTS

E-6985
(2-77)

SPAN LINE POWER AND ERROR TEST RECORD FORM
T-CARRIER REPEATER BAYS

Office ______________________ Bay Number ______________________ Date ______________________

Span ______________________ Shelves ___ & ___

Rept. Pos.	Line Current	Reg. Volt	Line Volt	Error Test Rec.	Error Test XMT.
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
*Norm Readings				Brdg.	
Rept. Type ______		Power Feed ______		Line Current ______	

Span ______________________ Shelves ___ & ___

Rept. Pos.	Line Current	Reg. Volt	Line Volt	Error Test Rec.	Error Test XMT.
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
*Norm Readings				Brdg.	
Rept. Type ______		Power Feed ______		Line Current ______	

Span ______________________ Shelves ___ & ___

Rept. Pos.	Line Current	Reg. Volt	Line Volt	Error Test Rec.	Error Test XMT.
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
*Norm Readings				Brdg.	
Rept. Type ______		Power Feed ______		Line Current ______	

* The Norm Is The Most Frequently Observed Value In Each Column.

WORK SHEET FOR T-CARRIER CHANNEL, TRUNK MAKE BUSY AND CARRIER GROUP ALARM (CGA) OPTIONS

E-6986
(2-77)

Office ______	Date ______	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
System ______	Channel Unit Type																								
RR ______	Channel Options																								
MDF Loc. ______	CGA Options																								
	Make Busy Jumper																								
System ______	Channel Unit Type																								
RR ______	Channel Options																								
MDF Loc. ______	CGA Options																								
	Make Busy Jumper																								
System ______	Channel Unit Type																								
RR ______	Channel Options																								
MDF Loc. ______	CGA Options																								
	Make Busy Jumper																								
System ______	Channel Unit Type																								
RR ______	Channel Options																								
MDF Loc. ______	CGA Options																								
	Make Busy Jumper																								
System ______	Channel Unit Type																								
RR ______	Channel Options																								
MDF Loc. ______	CGA Options																								
	Make Busy Jumper																								
System ______	Channel Unit Type																								
RR ______	Channel Options																								
MDF Loc. ______	CGA Options																								
	Make Busy Jumper																								

Legend: OK = Correct   * = Incorrect Option Or Missing Jumper   Δ = Incorrect NBOC   □ = Other ______

WORK SHEET FOR T-CARRIER REPEATER BAYS

E-6987
(2-77)

Office _____ Date _____

Bay Number	Shelves	Span	Case	Power Options	Fuses	Alarms		Order Wire	Fault Locating Line	Other
						Visual	Audible			

Notes: