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108

Issues in Locomotive Crew Management and Scheduling

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16. Abstract

This study explores matters related to the scheduling and management of locomotive crews, particularly as they might contribute to fatigue and stress. It describes how crews are scheduled currently, why there is so much unpredictability in schedules, how various aspects of current practices contribute to fatigue and stress, and what options exist to improve matters. It is based mostly on interviews with operating managers, dispatchers and crew callers on various railroads, discussions with union officials and focus-group sessions with working engineers. The mechanics of scheduling trains and crews on each of seven roads are discussed along with the timing of scheduling decisions, current problems and planned improvements in communications and control.

Among the causes of fatigue identified by engineers who participated in the focus groups are: uncertainty as to the time ones next job will be called, excessive working hours, long commutes and waiting times, the poor condition of some locomotives and other equipment, unsatisfactory conditions for sleeping at some terminals, poor distribution of workload among the crew, interpersonal conflicts with dispatchers and crew callers, and deliberate choices by crewmen to do something other than resting during the day even when they knew they might be called for work that night.

Possible corrective measures suggested are: a minimum of eight hours notice before reporting for work, greater predictability in scheduling, and division of the pools according to the period of the day when they were susceptible to calls. Plans for implementing some of these measures are discussed.

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METRIC / ENGLISH CONVERSION FACTORS

ENGLISH TO METRIC

LENGTH (APPROXIMATE)

1 inch (in) = 2.5 centimeters (cm)
1 foot (ft) = 30 centimeters (cm)
1 yard (yd) = 0.9 meter (m)
1 mile (mi) = 1.6 kilometers (km)

AREA (APPROXIMATE)

1 square inch (sq in, in^2) = 6.5 square centimeters (cm^2)
1 square foot (sq ft, ft^2) = 0.09 square meter (m^2)
1 square yard (sq yd, yd^2) = 0.8 square meter (m^2)
1 square mile (sq mi, mi^2) = 2.6 square kilometers (km^2)
1 acre = 0.4 hectares (he) = 4,000 square meters (m^2)

MASS - WEIGHT (APPROXIMATE)

1 ounce (oz) = 28 grams (gr)
1 pound (lb) = .45 kilogram (kg)
1 short ton = 2,000 pounds (lb) = 0.9 tonne (t)

VOLUME (APPROXIMATE)

1 teaspoon (tsp) = 5 milliliters (ml)
1 tablespoon (tbsp) = 15 milliliters (ml)
1 fluid ounce (fl oz) = 30 milliliters (ml)
1 cup (c) = 0.24 liter (l)
1 pint (pt) = 0.47 liter (l)
1 quart (qt) = 0.96 liter (l)
1 gallon (gal) = 3.8 liters (l)
1 cubic foot (cu ft, ft^3) = 0.03 cubic meter (m^3)
1 cubic yard (cu yd, yd^3) = 0.76 cubic meter (m^3)

TEMPERATURE (EXACT)

$[(x - 32)(5/9)]\ °F = y\ °C$

METRIC TO ENGLISH

LENGTH (APPROXIMATE)

1 millimeter (mm) = 0.04 inch (in)
1 centimeter (cm) = 0.4 inch (in)
1 meter (m) = 3.3 feet (ft)
1 meter (m) = 1.1 yards (yd)
1 kilometer (km) = 0.6 mile (mi)

AREA (APPROXIMATE)

1 square centimeter (cm^2) = 0.16 square inch (sq in, in^2)
1 square meter (m^2) = 1.2 square yards (sq yd, yd^2)
1 square kilometer (km^2) = 0.4 square mile (sq mi, mi^2)
1 hectare (he) = 10,000 square meters (m^2) = 2.5 acres

MASS - WEIGHT (APPROXIMATE)

1 gram (gr) = 0.036 ounce (oz)
1 kilogram (kg) = 2.2 pounds (lb)
1 tonne (t) = 1,000 kilograms (kg) = 1.1 short tons

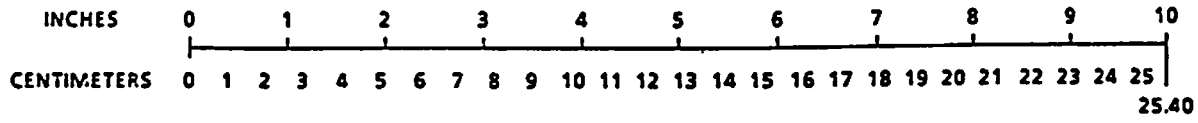
VOLUME (APPROXIMATE)

1 milliliter (ml) = 0.03 fluid ounce (fl oz)
1 liter (l) = 2.1 pints (pt)
1 liter (l) = 1.06 quarts (qt)
1 liter (l) = 0.26 gallon (gal)
1 cubic meter (m^3) = 36 cubic feet (cu ft, ft^3)
1 cubic meter (m^3) = 1.3 cubic yards (cu yd, yd^3)

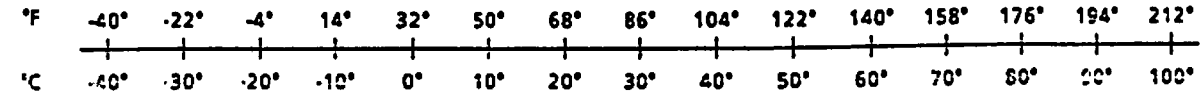
TEMPERATURE (EXACT)

$[(9/5)y + 32]\ °C = x\ °F$

QUICK INCH-CENTIMETER LENGTH CONVERSION



QUICK FAHRENHEIT-CELCIUS TEMPERATURE CONVERSION



For more exact and/or other conversion factors, see NBS Miscellaneous Publication 286, Units of Weights and Measures. Price $2.50. SD Catalog No. C13 10 286.

Preface

This study was conducted for the Federal Railroad Administration's Office of Industry Finance and Operations by the Research and Special Programs Administration's Volpe National Transportation Systems Center (VNTSC). It is intended to provide FRA and other concerned officials with an understanding of how crews are scheduled currently, why there is so much unpredictability in schedules, how various aspects of current practices contribute to fatigue and stress, and what options exist to improve matters.

The author is grateful to the many managers and operating personnel of various railroads who gave freely of their time in interviews and supplied most of the exhibits included in this document, to the union officials who provided many valuable insights, and to all of the working engineers who participated in focus groups designed to explore the causes of stress and fatigue in their lives.

Particular thanks are due to John Murphy, Chief of the Special Projects Division of the FRA's Office of Industry Finance and Operations, and to Richard Shamberger, also of that office, who served as Technical Monitor.

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Executive Summary

The purpose of this study is to explore matters related to the scheduling and management of locomotive crews, particularly as they impinge on fatigue and stress. The intent is to provide FRA and other concerned officials with an understanding of how crews are scheduled currently, the causes of unpredictability in schedules, whether various aspects of current practices may contribute to fatigue and stress, and what options exist to improve matters.

Since very little documentation exists pertaining to these questions, this exploration was conducted almost entirely by means of interviews with operating managers, dispatchers and crew callers on various railroads, discussions with BLE and UTU officials and focus-group sessions with working engineers, as described in Section 1. A representative sample of seven Class I railroads participated.

Section 2 of this report describes the mechanics of scheduling trains and crews on each of the seven roads. The timing of scheduling decisions, current problems and planned improvements in communications and control are discussed.

Section 3, based primarily on the comments and views of engineers in the focus groups, describes the principal factors contributing to fatigue and stress in the current environment. These include:

- uncertainty as to the time ones next job will be called,
- excessive working hours (at certain terminals),
- long commutes and waiting times (for some workers),
- the poor condition of locomotives and other equipment (at some locations),
- unsatisfactory conditions for sleeping at some terminals,
- poor distribution of workload among the crew, and
- interpersonal conflicts with dispatchers and crew callers.

To this list, many managers would add deliberate choices by crewmen to do something other than resting even when they knew the should be resting. Attempting to make quantitative statements about the relative importance of each of these contributors to fatigue would require appropriate survey data, which is not available.

Railroad management seems well aware of these problems and inclined to take action on some of them. In Section 4, these possibilities are discussed. In particular, most railroads have plans to upgrade communications

and control systems over the next few years so as to improve their ability to forecast train arrival and departure times. Providing an eight- or ten-hour advance notice of call accurate to plus-or-minus two hours 90% of the time or better is viewed as a goal achievable within three or four years by most of the managers interviewed. Engineers and labor officials felt the prospects for meeting this target would be greatly enhanced if there were a penalty payment assessed for each failure to supply such notice.

Because the vast majority of road crews work in first-in, first-out rotating pools, advance knowledge of train departure times is only half the solution to providing advance notice of call. In many situations, when one worker unexpectedly "marks off" (becomes unavailable because of illness or any other reason) every other worker with lower standing in the same pool moves up one position in the standings, i.e., leaves on an earlier train than previously estimated. Providing an accurate advance notice of call would be impossible in such situations. However, changing these practices could be done only in collective bargaining. Adoption of such changes should be beneficial to both sides and may proceed expeditiously once systems for predicting train departure times accurately are working well.

Some of the other sources of fatigue and stress, related to the condition of equipment and facilities, will require significant financial outlays to correct. These raise questions about economic issues which are beyond the scope of this study. However, many others are low-cost items, such as, broken air conditioners and wheel-revolution counters.

Many of the remaining causes of stress and fatigue result from failures to adapt to changes in technology, organization and location of facilities. Following these changes, seniority rights have left a good many individuals in jobs which do not suit them very well in one way or another. Workers are often mismatched to their jobs in the sense of having been compelled to move away from communities to which they have strong ties, or in the sense of having very long commutes (longer than 50 miles), or sometimes in having to do work which they dislike (e.g., redundant operating employees assigned to clerical jobs). Only the passage of time, adjustments in relative wages and salaries, and/or "buy outs" can eliminate these individuals who are mismatched to their jobs. Other failures to adapt to change are rooted in provisions of labor agreements dating back decades. By and large, both labor and management know what needs to be done, but actually doing it is often impeded by the gamesmanship of the negotiating process. In many cases the result of the bargaining process is a phased-in introduction of some change so that it affects only new hires. Thus periods of more than 20 years may lapse before some of the desired changes described herein are fully implemented.

1.0 Introduction

1.1 Background

In order to examine the subject of fatigue and possible sleepiness in relationship to the job of railroad operating personnel, it is necessary to understand thoroughly the mechanics of the crew scheduling process and the notification (crew calling) procedures currently in use. The scheduling and calling of railroad operating crews is a function of the union-management labor contracts and the demands of an efficient rail freight system. Although railroad personnel have a working understanding of their own systems, documentation of these systems comprehensible by outsiders does not exist. A systematic examination of how crews are scheduled, and the potential effects on safety, needs to proceed from specific factors. Careful scrutiny of the operating environment is necessary in order to test hypotheses and to understand the full costs and benefits of implementing alternative practices.

1.2 Objectives

The purpose of this effort is to develop a report that describes the present crew scheduling and notification systems in objective, straightforward terms. For each railroad studied, key decisions and information flows affecting crew calling are identified. Particular attention is focused on the causes of uncertainty in each of these decisions. Ideas for improvements have been collected from each person or group interviewed.

An understanding of how uncertainty affects fitness for duty has also been sought. In the absence of established objective measures of fitness for duty, the best alternative is simply asking working engineers about their experiences and what causes stress and fatigue.

1.3 Approach

Examination of the literature revealed nothing in the way of descriptions of how crew scheduling systems work. Although there is a substantial body of research on the effects of sleep deprivation and disruption of circadian rhythms, none has been found which focused on locomotive crews. The few recent publications which relate to railroads at all have been concerned with training personnel to cope better with their odd working hours, rather than exploring the causes of those unpredictable hours and the prospects for reducing the uncertainty.

In view of the absence of useful documentation, the approaches taken for this project focused on gaining an understanding of the issues through discussion with persons directly involved with managing and scheduling locomotive crews and with the working road engineers.

1.3.1 Interviews

The bulk of this report is based on interviews conducted with staff and operating personnel of several major railroads. These interviews were conducted on site at dispatching and crew-calling centers operated by the participating railroads. Depending on the organization of the railroad in question, these sites may have been located at the division level, at the single centralized facility for the entire railroad, or at some intermediate level.

Most of the interviews were arranged by writing and/or telephoning each railroad's vice president for operations and explaining the objectives of the project. Further arrangements were then made with whatever officials were designated by senior management. In some instances, contacts were initiated at the division level or directly with the manager of crew calling.

Nearly all of the railroads contacted agreed to participate. The managers involved proved most generous with their time in providing full and frank responses to all questions. Two of the roads, Burlington Northern and CSX, contributed glossaries of crew-calling terminology, which were merged and reproduced as Appendix A.

Several labor officials were also interviewed. These discussions focused on their perceptions of the effects of current scheduling practices on the fatigue and stress levels of their members and their ideas for improvements. As with management, cooperation with the study was excellent.

1.3.2 Focus Groups

In order to gain insight into the perceptions of engineers about the factors causing stress and fatigue, a series of focus-group discussions was arranged through the cooperation of the Brotherhood of Locomotive Engineers. These discussions allowed the author to question about two dozen engineers and directly observe their reactions to various proposals for change.

The first of these groups consisted of six engineers working out of a major East Coast terminal. Their situation was one in which train departure times were relatively more predictable than on most other railroads, but working hours were greater due to a shortage of staff. Most worked in pools on jobs of 140-150 miles, but two had assigned service runs of about 300 miles.

The second group consisted entirely of engineers working in road-freight pools. About half of them worked in inter-divisional pools with runs of 232 or 256 miles; the remainder worked on a 143-mile run. Their monthly work quotas were based on 3900 miles, so that those in the long pools needed to work only eight or nine round trips per month. Working hours averaged slightly more than 40 per week in this group, but total hours away from home ran to 70-75 per week.

In the third group, most of the jobs were in pools exceeding 200 miles, but two were from extra-boards protecting such service, and two were from helper districts. Monthly quotas were based on 3800 miles, which implies eight round trips per month. An average of about 48 working hours per week were required to complete two round trips.

2.0 Descriptions Of Crew-calling Systems Of Various Railroads

2.1 Burlington Northern

The nation's largest railroad (by miles of track operated) is currently undergoing a transition from traditional manual crew-calling practices to a computerized system. This change requires several years to implement. In this section both types of systems are described, based on interviews with BN officials in different regions.

Altogether, the BN starts about 500 trains per day, not including yard engines. About 825 road crews drawn from approximately 14,000 trainmen and enginemen are required.

On the Northern Region, comprised of former Great Northern and Northern Pacific lines, train dispatching is consolidated in Seattle and Minneapolis, but crew calling is mostly handled manually by clerks in the district offices. The Northern Region starts about 150 trains per day, requiring about 440 crews per day from the nearly 6,000 engineers and trainmen employed. Interviews were conducted at regional headquarters and by telephone with a district clerk.

Dispatching for the Southern Region is done in McCook and Alliance, Nebraska. Crew calling is being consolidated at the division level. This transition was implemented early in 1989 for the Denver Division, where interviews were conducted. This division includes 12 terminals and requires 300 to 400 crews per day including yard service. 34 callers are assigned to Denver with six to eight on duty at any given time.

Train Dispatching

Nominal schedules for the entire railroad are established and modified by the staff in Overland Park. Allocation of locomotives is also centralized there for the entire road in the Diesel Control Center.

Dispatchers in Seattle, Minneapolis, McCook and Alliance make the schedule adjustments, cancellations, combinations and orders for extras as appropriate to traffic on a given day. They transmit their new lineups to the clerks in the district offices and crew callers in divisional offices every four hours. These are distributed via FAX to each individual clerk or caller. Dispatchers make the decision about what time to call a crew for a given train and relay this information to callers or clerks by voice phone. The dispatchers have access to the computerized crew-calling system and can readily incorporate crew-balancing considerations into their decisions about where and when to run trains. Figure 2.1-1 shows this process schematically.

BN's most difficult problem in producing accurate estimates of train departure times is inadequate information flow among yardmasters, dispatchers and shippers. This is especially true of unit coal trains, which comprise 90% of the movements on the Denver Division. Mine operators and power plants are supposed to notify the railroad 24 hours in advance of the time they expect to release a train. However, they often experience equipment problems and other difficulties which prevent their achieving their predicted release times.

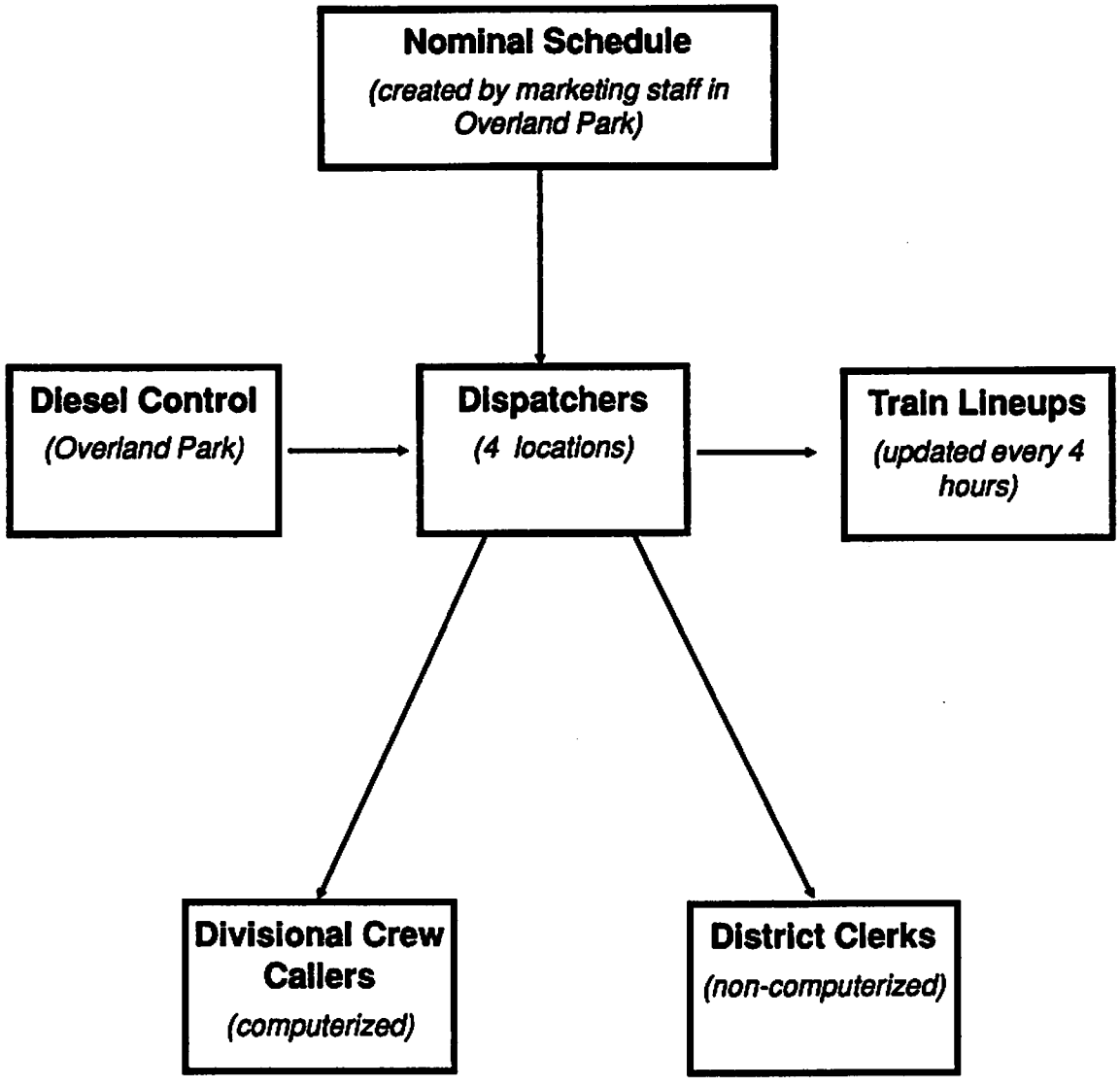


Figure 2.1-1: Simplified Chart of Train and Crew Dispatching on the Burlington Northern.

Calling

Throughout the Northern Region, crew calling is done by clerks in the district offices using traditional chalkboard or tagboard procedures to keep track of the status of each employee and pool rotation. Clerks make their calls in response to the requests they receive by voice phone from individual dispatchers. Calling times are set by local agreement and vary from one to two hours.

Collectively these agreements amount to a mind-boggling array of details about who may be called for what kind of job under what conditions at what place. For the railroad as whole, the written rules and agreements would fill a book case. Beyond these are a large but unknown number of informal agreements between local chairmen and district personnel. District clerks are expected to learn all of these rules and agreements, at least so far as they apply in the office where the clerk is working. To simplify that task, one BN clerk extracted from the numerous rule books, manuals and labor agreements the handbook which is reproduced in Appendix C.

In a computerized division like Denver, crew calling is done from work stations like that in Figure 2.1-2. Callers can perform any of the functions shown in the menu appearing in Figure 2.1-3.

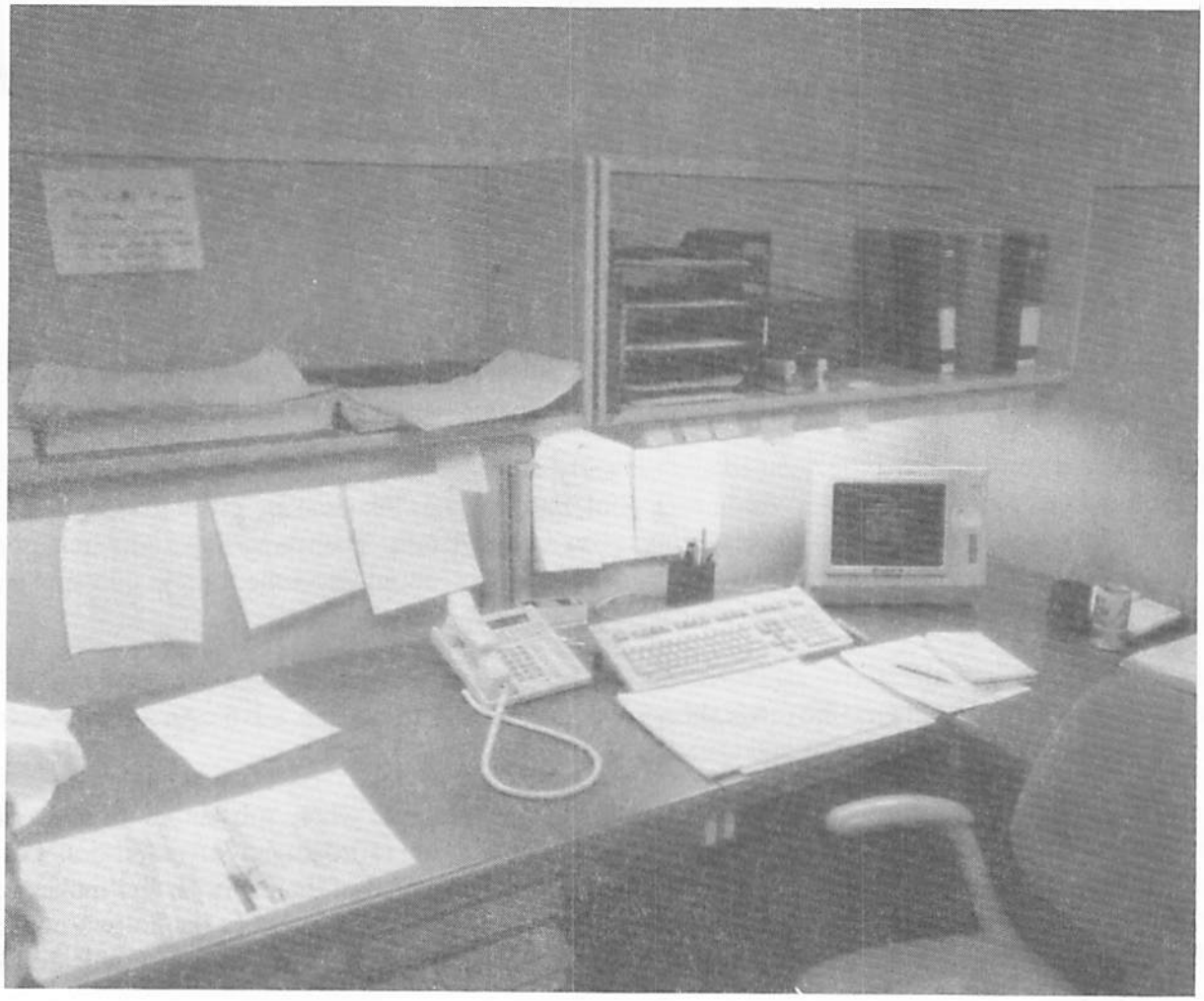


Figure 2.1-2: Crew Caller's Work Station on the Burlington Northern.

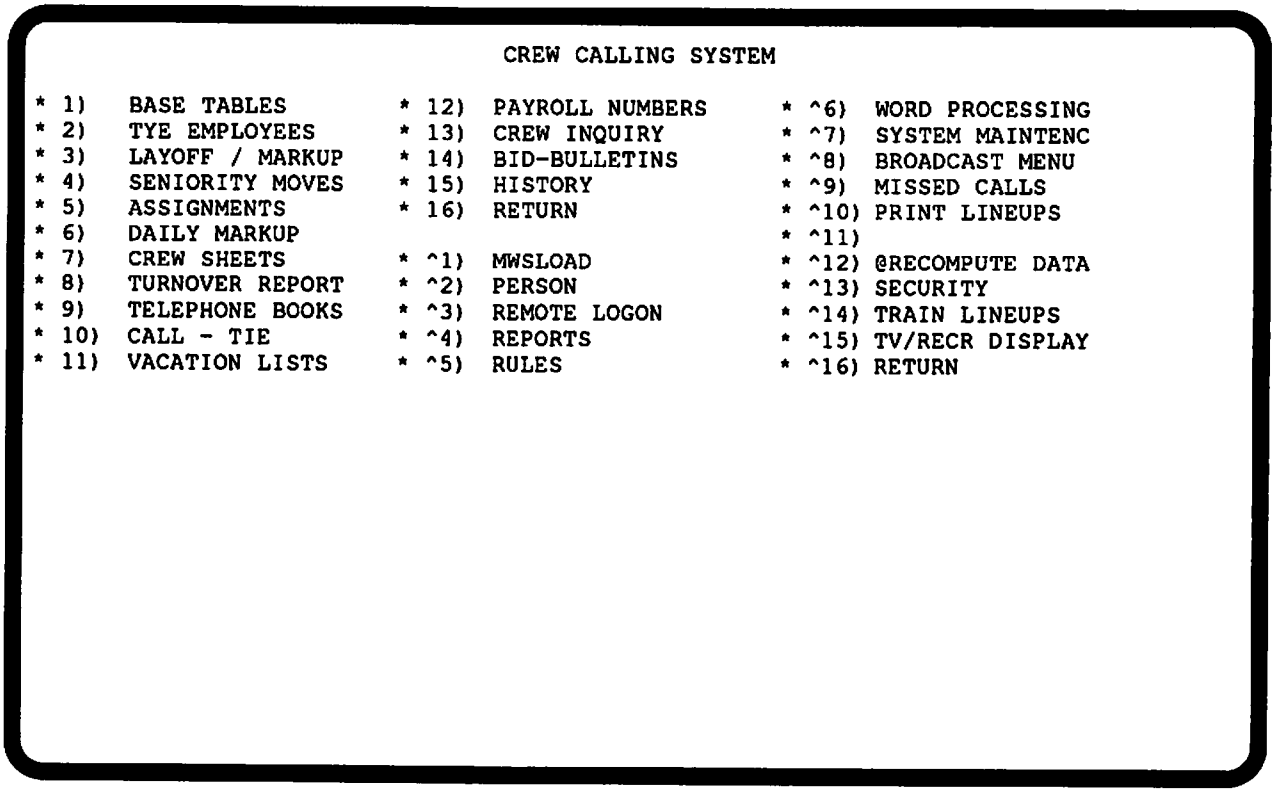


Figure 2.1-3: Main Menu of Crew-Calling Functions at the BN.

Information Available to Employees

In the non-computerized districts, employees seeking information about their next jobs have only two sources -- the district clerks or the tape-recorded announcements. Both are available through toll-free numbers.

The recorded announcements are quite detailed and typically run for several minutes. For a given terminal the messages are blocked according to pool. Within each pool, the standings by name are given first, with the time each person not yet rested will have done so. Incoming crews are also listed. Then departing trains are described with their expected departure times and sometimes some information about when the train in question passed some prior station. This sequence is repeated for each pool in the district.

In a computerized division, the above described means of access are supplemented by terminals at each crew-station. These provide screens like those shown in Figures 2.1-4, 2.1-5 and 2.1-6. An automatic-voice-response system is now being developed and tested.

Standings and lineups are also available on cable television in several towns where substantial numbers of BN employees live. Cable operators provide this service at no charge to the railroad and at no additional charge above their basic rates to subscribers. They find that it enhances the appeal of their service and makes use of otherwise empty channels. BN updates the information fed to the cable services every one to two hours and reports that the volume of telephone calls from the towns where this cable service is available has been substantially reduced.

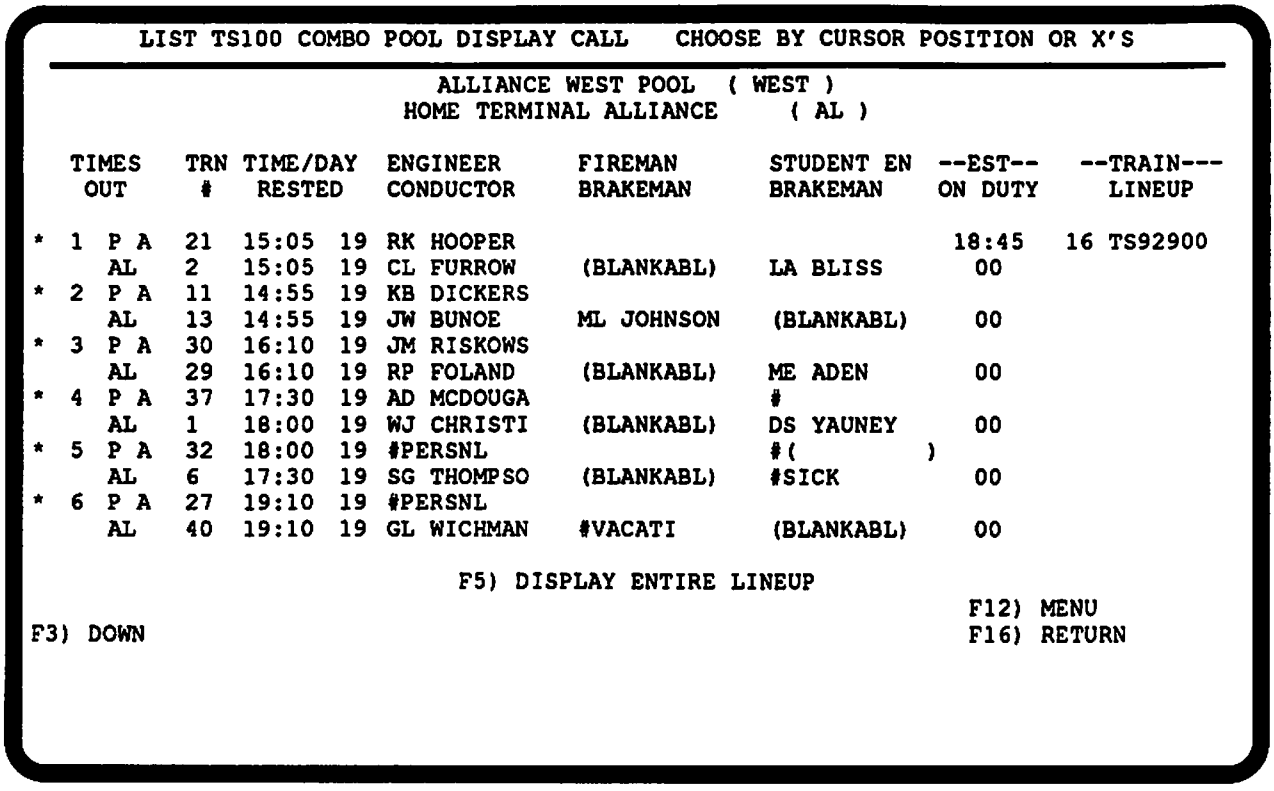
On the Denver Division, the accuracy of train lineups is monitored and reported weekly. For the first half of 1990, about 72% of all trains were called within four hours of the time originally estimated, 11% were called within four to six hours, and 17% were called more than six hours from the original estimate.

```
BURLINGTON NORTHERN RAILROAD - CREW CALLING SYSTEM

                TYE EMPLOYEE REMOTE DISPLAY INFORMATION
     PRESS THE APPROPRIATE "F" KEY TO OBTAIN THE DESIRED INFORMATION

     F1) POOLS                          F5)   YARD ASSIGNMENTS
     F2) EXTRA BOARDS                   F6)   ENGINEERS OFF ASSIGNMENT
     F3) OPEN BULLETINS                 F7)   ROAD ASSIGNMENTS
     F4) WHAT CAN I HOLD                F8)   VACATION SCHEDULES
               F9) GENERAL NOTICES (MILEAGE, BOARD CHANGES, ETC.)
```

Figure 2.1-4: Menu of Information Available to Trainmen and Enginemen.

```
LIST LINEUP VIEW                                    CHOOSE BY CURSOR POSITION OR X'

              BURLINGTON NORTHERN RAILROAD - CREW CALLING SYSTEM
          OUTBOUND LINEUP FOR:  DENVER - BN DT DIRECTION:  EASTBOUND E
                          PROTECTING POOL:  DT COAL

 --TRAIN ID--   EST ARRIVAL  --ON DUTY--                          ---TO TIE--  S
  SEC  SYMBL DY  TIME/DY/LOC  TIME/DY/LOC    LEAD ENG   REMARKS   LOC/TIME/DY  T
* 16  TS929 00                07:45  20 DT                        SQ 12:15 20  P
* 239 QQ051 00                10:15  20 DT                        SQ 14:25 20  A
* 145 T031  00                14:00  20 DT                        SQ 18:30 20  P
* 01  060   20                04:30  20 DT                        MC 10:30 20  P




ENTER) MODIFY            6) ADD / ADD 1ST                10) TT TIMES / T FILE
1) MARK / CLEAR ALL      7) QUERY / TURNS AT LOCATION    11) INBOUND LINEUP
                         8) DELETE / OUTBOUND ONLY       12) TRAIN'S SCHEDULE
                         9) UPDATE ONDUTY TIME / INBOUND 16) RETURN / MENU
```

Figure 2.1-5: Example of Train Lineup Available on Terminals at BN Crew-Change Stations.



```
LIST TS100 COMBO POOL DISPLAY CALL   CHOOSE BY CURSOR POSITION OR X'S

                    ALLIANCE WEST POOL  ( WEST )
                    HOME TERMINAL ALLIANCE    ( AL )

  TIMES   TRN TIME/DAY  ENGINEER      FIREMAN       STUDENT EN  --EST--   --TRAIN---
   OUT     #   RESTED   CONDUCTOR     BRAKEMAN      BRAKEMAN    ON DUTY    LINEUP

* 1 P A  21  15:05  19 RK HOOPER                                 18:45   16 TS92900
    AL   2   15:05  19 CL FURROW    (BLANKABL)    LA BLISS       00
* 2 P A  11  14:55  19 KB DICKERS
    AL   13  14:55  19 JW BUNOE     ML JOHNSON    (BLANKABL)     00
* 3 P A  30  16:10  19 JM RISKOWS
    AL   29  16:10  19 RP FOLAND    (BLANKABL)    ME ADEN        00
* 4 P A  37  17:30  19 AD MCDOUGA                 #
    AL   1   18:00  19 WJ CHRISTI   (BLANKABL)    DS YAUNEY      00
* 5 P A  32  18:00  19 #PERSNL                    #(          )
    AL   6   17:30  19 SG THOMPSO   (BLANKABL)    #SICK          00
* 6 P A  27  19:10  19 #PERSNL
    AL   40  19:10  19 GL WICHMAN   #VACATI       (BLANKABL)     00

                    F5) DISPLAY ENTIRE LINEUP

                                                   F12) MENU
F3) DOWN                                           F16) RETURN
```

Figure 2.1-6: Example of Standings Information Available on BN Terminals.

2.2 Conrail

Conrail recovered from its economic distress of the 1970s and is now a healthy, profitable carrier, enjoying the fruits of the heavy investments made in plant improvements. Many of its main lines are maintained for 70 MPH passenger train service and its fleet of locomotives is relatively new and well maintained. It is now operating about 600 trains per day, of which about 95% arrive on time.

Conrail has long been an industry leader in the development of computerized control systems and its current system can fairly be described as state-of-the art. Figure 2.2-1 shows an overview of a small portion of the Albany Division control room. In the foreground are two Assistant Chief Dispatchers. Each of them supervise about three Dispatchers, who sit at control stations nearest the wall of monitors. At their computer screens, dispatchers and other officials may call up any of a large number of screens of data of various types or graphic representations of how the railroad is functioning. For example, Figure 2.2-2 shows intermodal train TV1 approaching a cleared route on the mainline west of Harrisburg. The actual screen is in color.

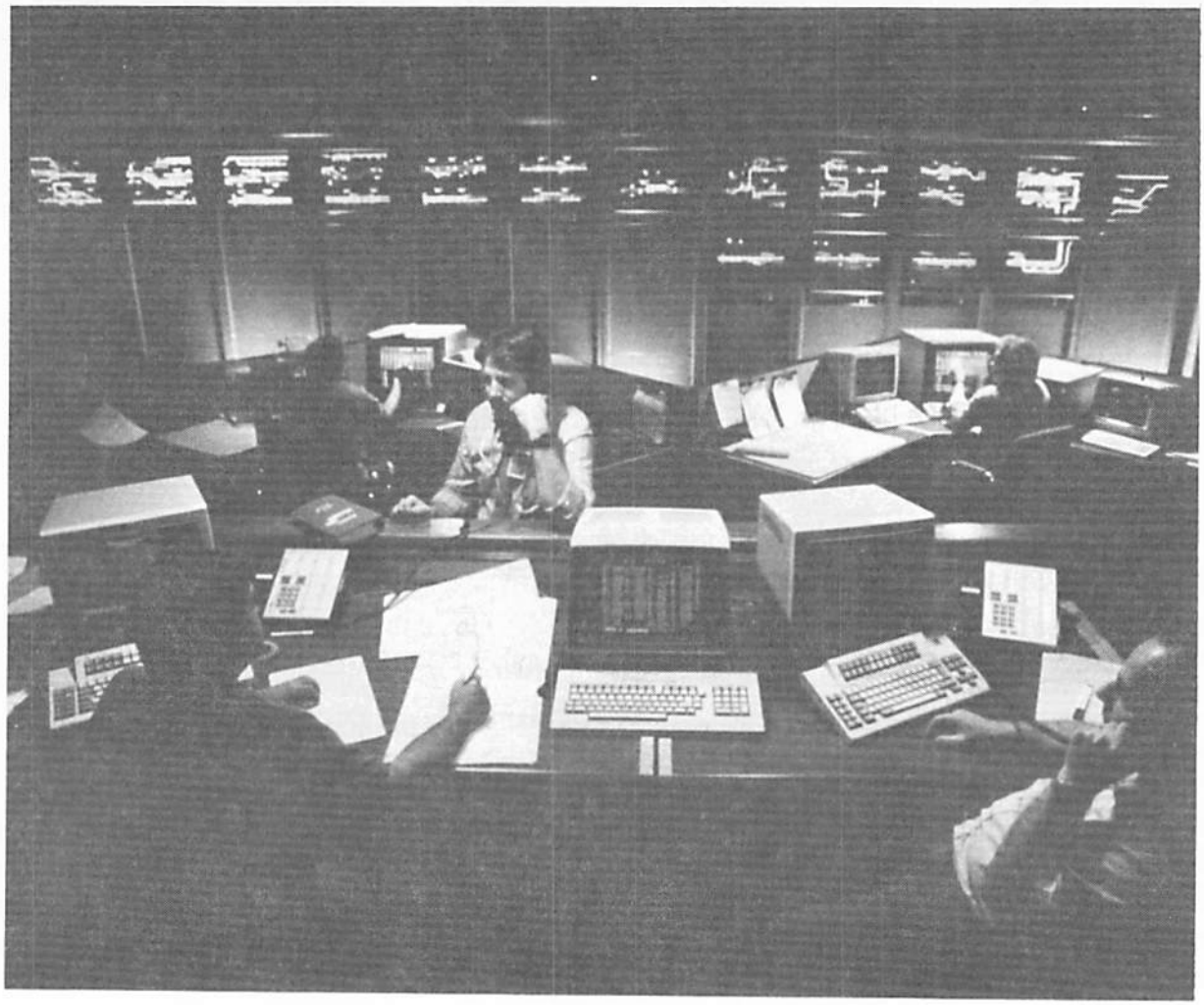


Figure 2.2-1: Partial View of Computer Assisted Train Dispatch System (CATD), at Conrail's Albany Division in Selkirk, NY

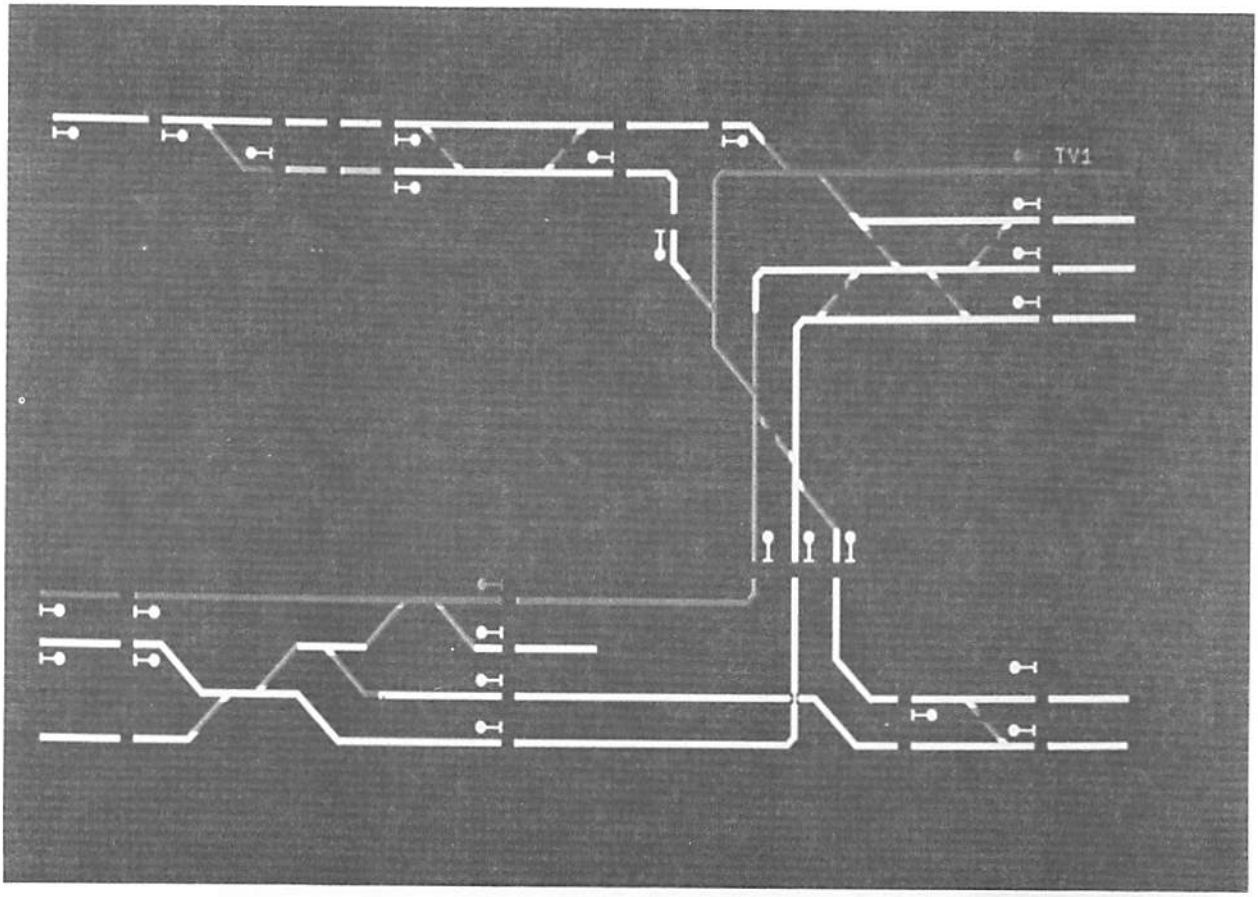


Figure 2.2-2: Visual displays depicting train locations and movements, as well as switch settings over sections of tracks, assist dispatchers in routing train movements safely over a specific geographic area. This display shows the position of a Conrail intermodal train, indicated by the symbol TV 1, as it approaches a cleared route of main line trackage west of Harrisburg, PA.

Information about any particular train can be called up as exemplified in Figures 2.2-3 and 2.2-4. Figure 2.2-3 shows the progress of train MAIL 3 as it left S. Kearny, NJ at 0704 ahead by 26 minutes. At the time this screen was captured, 16:18, the train had recently passed point CP-ANTIS 32 minutes ahead of schedule. Figure 2.2-4 shows information about the power, crew and loading of another train, BU0I2.

If any train is running late, data regarding the causes of the delay and the number of minutes of delay resulting from each of them, are available on a screen like that shown in Figure 2.2-5.

Interviews were conducted with officials of the Albany Division at Selkirk. The scheduling process described is used throughout Conrail, although the proportions of various types of service, train speeds, traffic balance, etc. may not be the same on other divisions. The Division officials interviewed included the General Manager, the Superintendent of Transportation and the Supervisor of Crew Calling. Conrail's General Superintendent for Road Foremen and Training was interviewed by telephone.

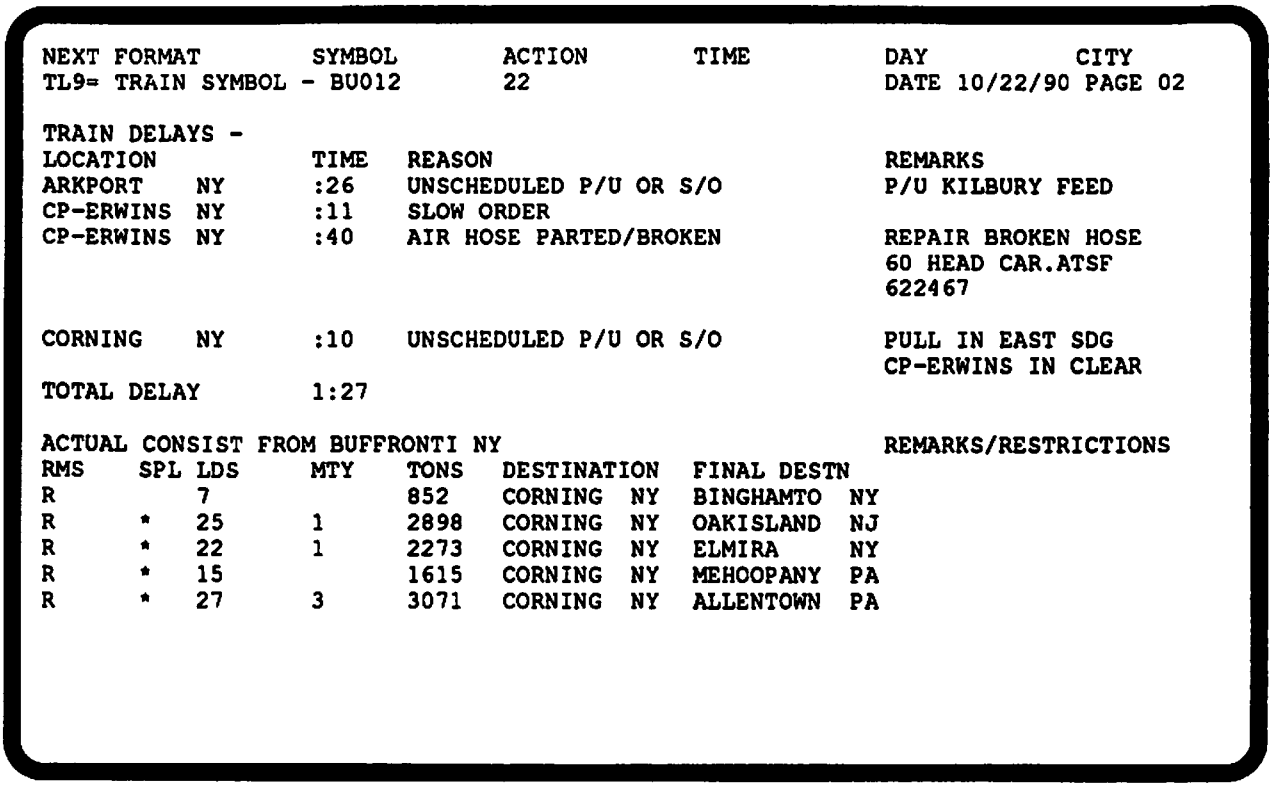
The Albany Division includes lines in New York, Massachusetts and Connecticut and operates about 110 trains per day. About ten percent of these are TOFC/COFC or perishables trains which are operated on high-speed schedules which are as regular as passenger service. Their crews enjoy regular, highly predictable assignments. The remaining 90 percent of road trains are operated with assigned and pool crews. In the following sections,

```
TL9= TRAIN SYMBOL - MAIL3 22    DATE 10/22/90 PAGE 02

                SCHEDULED ACTL          CREW  OUT OF ON      HP/TN   C O N S I S T
                DAY/TIME  TIME  A/L     CALL  HOUSE  TRAIN   RATIO  LDS    MTY    TONS
SKEARNYTV  NJ *OR 22/0730E 0704E 0026A 0615E                  00.00  16             974
NK         NJ PS  22/0800E 0733E 0027A                        00.00  16             974
PTREAJCT   NJ PS  22/0845E 0811E 0034A                               16             974
WPORTAL    NJ PS  22/0930E 0856E 0034A                               16             974
CP-BURN    PA PS  22/1017E 0943E 0034A                               16             974
ALBURTIS   PA PS  22/1040E 1002E 0038A                               16             974
CAPITOL    PA PS  22/1245E 1201E 0044A                               16             974
HARRISBTV  PA *AR 22/1250E 1206E 0044A 1205E                         16             974
HARRISBTV  PA LV  22/1345E 1301E 0044A                        00.00  48            2777
*CP-BANKS  PA PS  22/1410E 1326E 0044A                        00.00  48            2777
+CP-LEWIS  PA PS  22/1515E 1455E 0020A                               48            2777
+CP-ANTIS  PA PS  22/1650E 1618E 0032A                               48            2777
ALTOONA    PA PS  22/1700E
UN         PA PS  22/1740E
CP-CONPIT  PA PS  22/1835E
CP-RADE    PA PS  22/1935E
CP-PITT    PA PS  22/2005E
PITTSBUTV  PA AR  22/2015E
```

Figure 2.2-3: Screen View Showing Progress of a Particular Train.

```
NEXT FORMAT        SYMBOL        ACTION        TIME          DAY           CITY
TL9=   TRAIN SYMBOL - BU0I2      22                    DATE 10/22/90 PAGE 03

TRAIN ACTIVITY AT ARKPORT        NY
RMS  SPL  ACT   LDS   MTY   TONS   DESTINATION   FINAL DESTN    REMARKS/RESTRICTIONS
      *    PU          1     30     CORNING    NY  OAKISLAND  NJ

POWER              CONSIST:  BUFFRONTI NY     CORNING NY
LOCOMOTIVES:       6088      /   6052   /     6821   /
CABOOSES:          RCAB80096 S/

CREW               CONSIST:      BUFFRONTI NY TO CORNING NY
      NAME        JOB CODE              ON DUTY              OFF DUTY
J.E. ADIMEY        EN             10/22/90 0315 ET     10/22/90 1130 ET
G.R. MASONIS       CD             10/22/90 0315 ET     10/22/90 1130 ET
P.B. CRAWFORD      B1             10/22/90 0315 ET     10/22/90 1130 ET

          **********************END OF TRAIN INFORMATION******************
NEXT FORMAT        SYMBOL        ACTION        TIME          DAY           CITY
```

Figure 2.2.-4: Screen View Showing Information about Power, Crew and Loading of the Train BU0I2.



```
NEXT FORMAT        SYMBOL        ACTION        TIME          DAY           CITY
TL9= TRAIN SYMBOL - BU012        22                          DATE 10/22/90 PAGE 02

TRAIN DELAYS -
LOCATION           TIME   REASON                            REMARKS
ARKPORT    NY      :26    UNSCHEDULED P/U OR S/O            P/U KILBURY FEED
CP-ERWINS  NY      :11    SLOW ORDER
CP-ERWINS  NY      :40    AIR HOSE PARTED/BROKEN            REPAIR BROKEN HOSE
                                                            60 HEAD CAR.ATSF
                                                            622467

CORNING    NY      :10    UNSCHEDULED P/U OR S/O            PULL IN EAST SDG
                                                            CP-ERWINS IN CLEAR
TOTAL DELAY        1:27

ACTUAL CONSIST FROM BUFFRONTI NY                            REMARKS/RESTRICTIONS
RMS    SPL LDS     MTY    TONS   DESTINATION   FINAL DESTN
R          7              852    CORNING  NY   BINGHAMTO  NY
R      *   25      1      2898   CORNING  NY   OAKISLAND  NJ
R      *   22      1      2273   CORNING  NY   ELMIRA     NY
R      *   15             1615   CORNING  NY   MEHOOPANY  PA
R      *   27      3      3071   CORNING  NY   ALLENTOWN  PA
```

Figure 2.2-5: Screen View Showing Information about a Late Train.

crew calling procedures will be described separately for regular-assignment road trains, pool-service road trains, and yard and local work.

Regular-Assignment Road Trains

The mainline of the Albany Division is the "Water Level Route" from Buffalo to the New York City area. On the segment from Buffalo to Selkirk, there are six eastbound and six westbound assigned-service trains each day. Under Conrail's labor agreements, wages for road crews are based on mileage, and the opportunity to cover 306 miles in about six hours is eagerly sought. Crewmen who win these jobs enjoy comparatively high pay, short working hours, and schedules which are highly predictable both as to work hours and time away from home. Job assignments are bid off, based strictly on seniority with the result that the average age of crews on this run is well over 50 years. Once an assignment is won, a crew member generally holds it for months until a retirement results in a reshuffling.

Several of these trains are referred to as "relay" trains, as in "relay race." They run from one end of the Conrail system to the other without any switching. Crews are scheduled to arrive 30 minutes before the train is due so that paper work and other miscellaneous tasks can be completed and the late arrival of a crew member will not delay the train. These trains normally remain stopped for less than two minutes to complete a crew change.

Pool-Service Road Trains

For the other 90% of the Albany Division's trains, scheduling and crew calling are substantially more complex and less predictable than for the assigned-service trains. The process begins with the railroad's master freight-schedule book, which is also incorporated into the scheduling software. Everyone of Conrail's freights has a schedule and in fact something like 95% of them are currently operating on that published schedule.

The decision making process begins with the Yardmasters, who look at the traffic on hand in their yards and inbound on their computer screens as described above. Because of both daily and seasonal variations in traffic, it is frequently economic to combine some trains, while adding extras at other times. Special trains, such as coal trains, appear without any regularity. Scheduling is additionally complicated by the East Coast's three-to-one imbalance between terminating versus originating loads. As a result, eastbound trains are shorter and more numerous than westbound trains.

Based on the tonnages on hand and expected to arrive in the next few hours, Yardmasters make the decisions about which trains will run at what time and build their departure trains accordingly. When the last car for a given train is on the departure track, the Yardmaster notifies the Assistant Chief Dispatcher responsible for that yard that the train has been built. The latter in turn calls Philadelphia, from which power is assigned for the entire railroad. Because of the adequate size and high reliability of Conrail's locomotive fleet, there is rarely any difficulty in providing a consist sufficient to meet schedule requirements.

As soon as the power assignment is confirmed, the Assistant Chief Dispatcher informs the Crew Dispatcher that a crew is needed, whereupon the calls go out. Up to six crew callers are on duty at any time in the Albany Division. The two hours between the time a crew is called and the time it reports for work are not wasted, since it normally takes the Car Department about two hours to connect brake hoses and inspect the train.

Figure 2.2-6 illustrates these information flows schematically.

The crew callers have available on their computer screens a substantial body of information about traffic and the probable decisions of the Yardmasters about which trains will run at what hours. The Supervisor of Crew Calling says that about 90% of the time, the crew callers are able to estimate accurately whether a man who calls in will be called for a job in the next eight hours.

In making their decisions about whom to call, the crew callers are presented with a computer screen like the one shown in Figure 2.2-7, which shows the extra list standing at 12:00 on January 25, 1990, for road enginemen on lines east from Buffalo. Other screens, not shown, display the name, phone number(s), beeper number, qualifications, seniority, rest status, and other factors influencing availability, such as personal requests. Because of monthly wage guarantees, data about earnings must also be incorporated into the process. Also available on subsidiary screens are many other data relating to work record, missed calls and other such factors. The caller works down the list in the order presented on the screen of the workers who meet all criteria until he succeeds in contacting one "qualified" to accept the job. "Qualified" means that the worker is not only technically proficient in performing the job but also familiar with the route and "rested" as defined by the Hours of Service Act.

Any worker who can not be reached and does not respond to his beeper within 15 minutes is so noted. Accumulation of more than a reasonable number of such notations may subject a worker to disciplinary action, such as suspension.

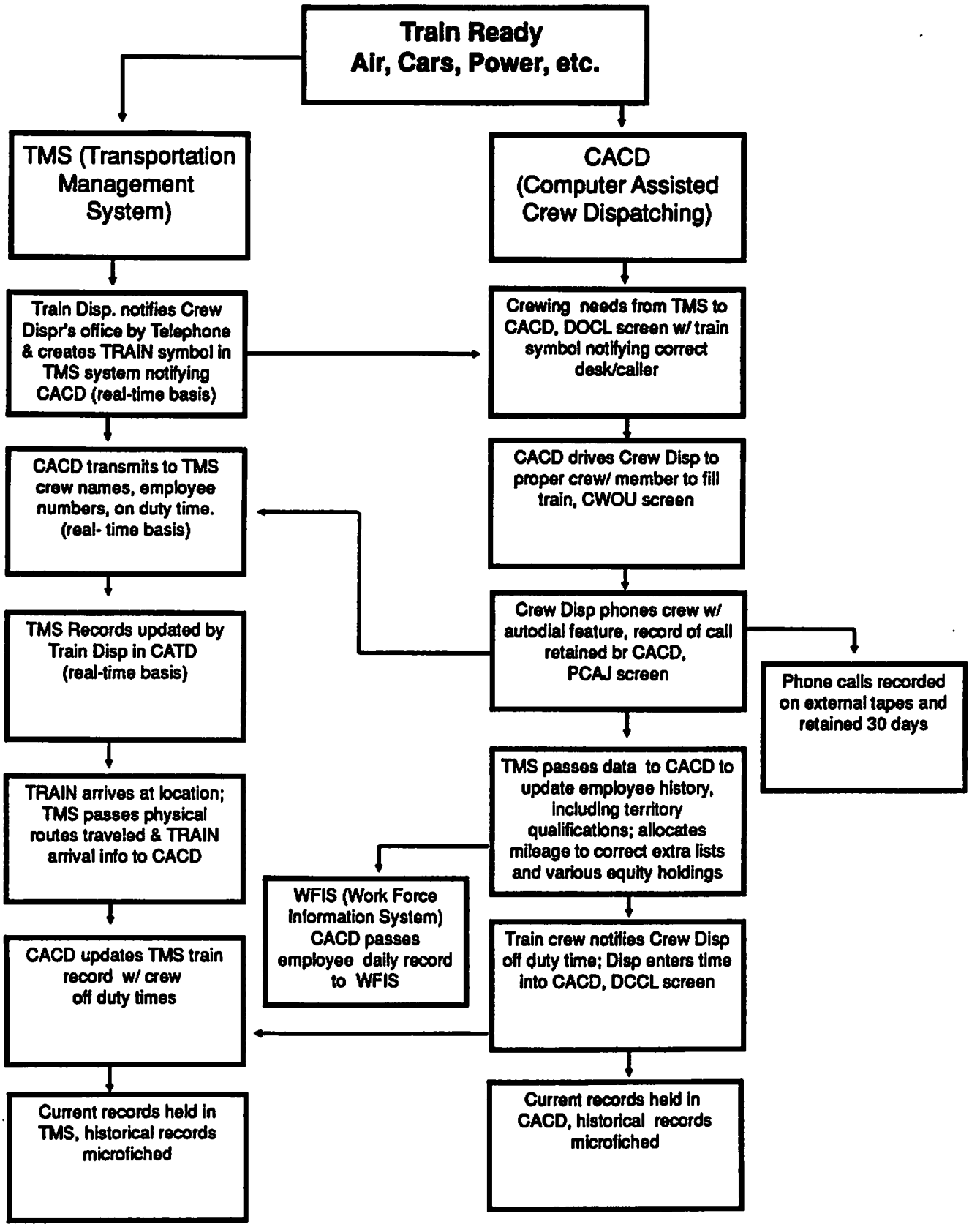


Figure 2.2-6: Flow Chart for Scheduling Conrail Road Trains and Crews.

0000 SELKIRK YARD TRAINEE LIST LAST UPDATE 11 13 90 1020

PRIOR RIGHTS: PC PRIOR/PRIOR RIGHTS: MOH

AUTHORIZED POSITIONS: 022 POSITIONS FILLED: 021

SAFETY RULE OF THE DAY: 1951 VOICE RESPONSE PHONE: 1-800-77-STAND

STD	RS TR	P R	STRGT START	ROST	PRIOR RIGHTS	EMPLOYEE NAME	MARKED TO BD DATE/TIME	RESTED DATE/TIME	LAST WORKING
001			01	3029		PP FERRIERO	11/12 0700	11/12 2300	YASE14
002			01	3026		WJ DEGRAFF	11/12 1559	11/13 0759	YASE26
003		C	01	1301	PC	MF COOTWARE	11/12 1559	11/13 0759	YASE25
004	R	C	01	1782		JB MCLEAN	11/12/1559	11/13 0759	YASE26
005			01	3024		JM NOVENCHE	11/12 2230	11/13 1430	YASE38
006	R	C	01	1837		SJ PURELLO	11/12 2230	11/13 1430	YASE38
007			01	3028		TL DEGONZAGUE	11/12 2245	11/13 1445	YASE30
008			00	3010		KJ TARDIFF	11/12 2255	11/08 1715	ENSE7
009			01	1757		JH MAGES	11/12 2300	11/13 1630	YASE37
010		C	00	1664	PC	WI ROBINSON	11/13 0913	11/13 0913	YSEDOX
A/C			00	3027		DM BAUER	11/11 0958	11/11 0958	WOR313
OUT			01	3023		BR KELLY			WOR313
OUT	R	C	01	1898		PJ HUSSON			FLG14X
OUT		C	01	1763		WC HALACY			WOR313
OUT			02	3025		MJ NOVENCHE			YASE13
OFF			00	1663	PC	NJ FERRIERE			YASE21
OFF		C	00	1766		RF BOARDMAN			FLG163
OFF		C	00	1773		KR ROBERTSON			YASE37
OFF	R	C	00	1949		M WHITE			YASE36
OFF		C	00	1945		LM WILLEY			YASE30

Figure 2.2-7: Example of Extra List Standing Screen.

Trainmen are guaranteed ten personal days off per year, plus their vacations plus sick days, but engineers have no such agreements. The computer software keeps track of these requests and removes their names from the calling list as required. Workers are encouraged to take their personal days on Sunday, Monday or Tuesday because traffic is lighter on these days due to weekend factory closings.

Because of the imbalances in traffic, deadheading is sometimes required. Labor agreements limit the amount of time a crew can be held away from home and housing them is certainly a significant cost. The Supervisor of Train Operations is responsible for deciding when to deadhead crews. Most deadheading is done aboard Amtrak trains on the mainline, but buses, taxis, limo services etc. are used elsewhere as required.

Yard Service and Local Freight

Crews on yard engines and local freights have regular assignments that tend to be stable over many months and sometimes years. Although the pay is not as good as most road work, the hours are predictable, most of the work is done during daylight, and a worker can spend much more time with family. These jobs are bid off on the basis of seniority and many workers are happy to tradeoff the extra pay of road work for the other advantages of yard work.

The flow chart for yard train and crew scheduling is presented in Figure 2.2-8.

On any given day, a few workers may be called from the extra board for yard and local work to allow for regular workers who are ill, vacationing etc. By labor agreement, yard jobs start between 6:30 and 8:00 for the first shift, 14:30 to 16:00 for the second shift, or 22:30 to 24:00 for the third. Workers whose regular assignments are changed must be given 48 hours notice.

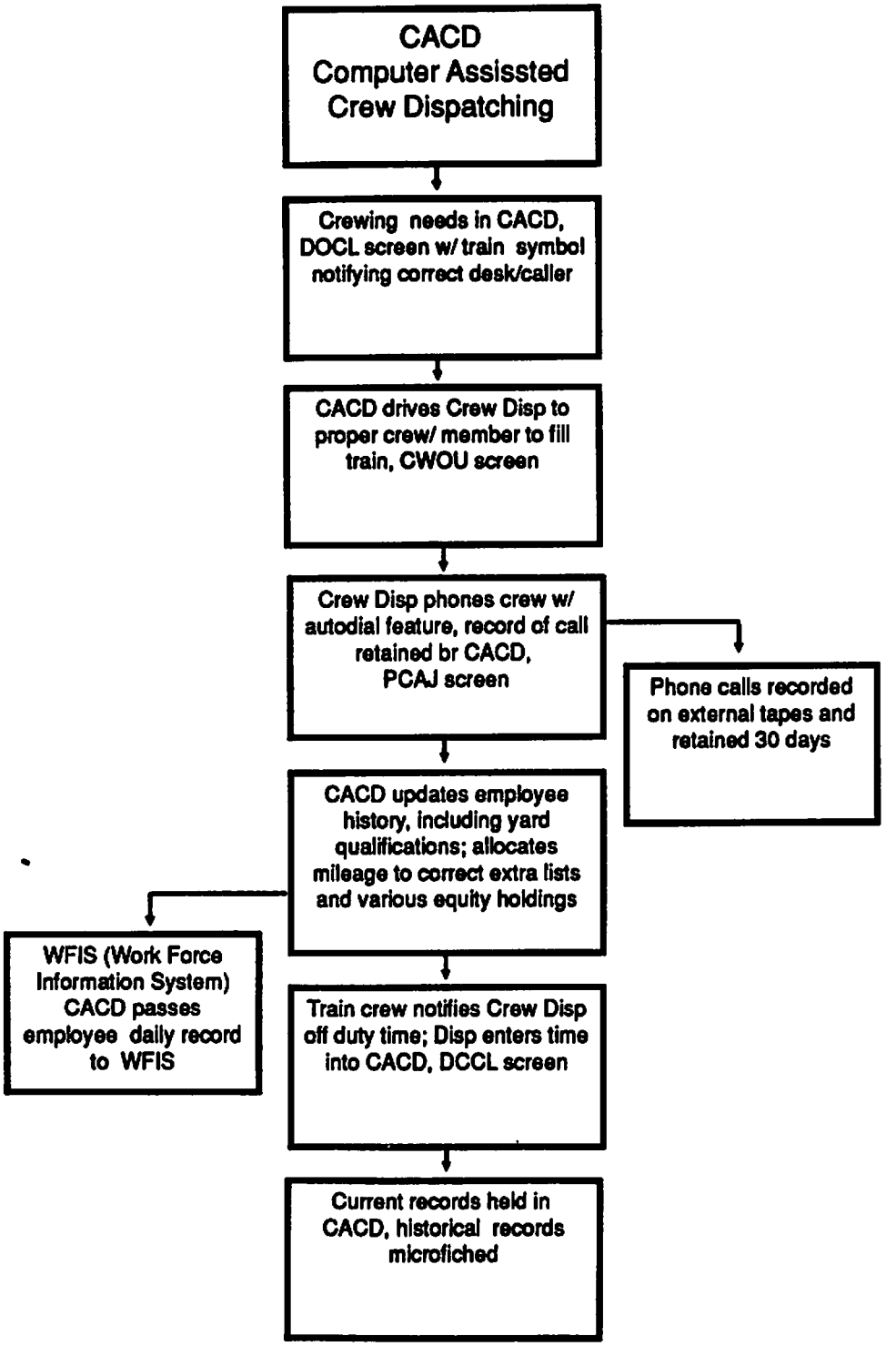


Figure 2.2-8: Flow Chart for Scheduling Yard Trains and Crews.

2.3 CSX Rail Transport

In February, 1990, CSX completed centralizing its train-dispatching and crew-calling operations at its Jacksonville operations center. Statistics for May, 1990, show that on an average day CSX operated 923 road crew starts, 620 yard crew starts and 456 local crew starts. 13,400 persons were employed as trainmen or enginemen.

The entire railroad is controlled from a large circular room, the wall of which consists almost entirely of video projection screens displaying all track and traffic symbolically. About two dozen Dispatchers occupy control stations on the periphery from which they can control switches and signals and converse with crews by radio. Above and inside sit nine Chief Dispatchers interspersed with six Power Coordinators. At the center of the room are a cluster of special functions such as the coal-train dispatchers, dispatchers for non-signalized territory and the Amtrak coordinator. Figure 2.3-1 shows work stations of a Chief Dispatcher and a Power Coordinator as well as a small portion of the wall.

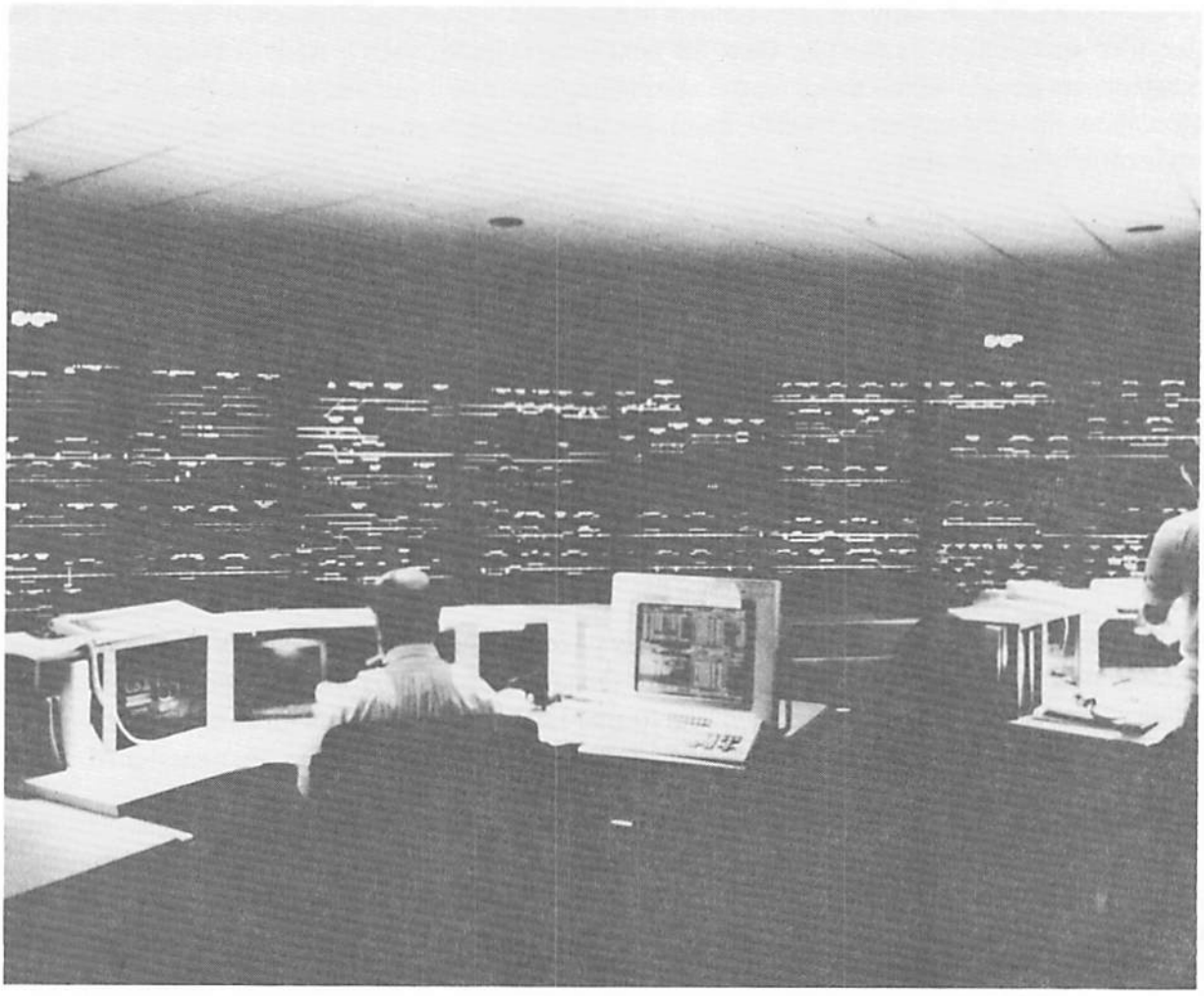


Figure 2.3-1: View of a Small Portion of CSX Operations Control Room Showing Work Stations of Chief Dispatchers and Power Coordinators.

All crew-calling is done from an adjacent room at the Jacksonville operations center. About 6,000 telephone calls were made each day to trainmen and enginemen to notify them of jobs. Around 20,000 calls were received daily through the toll-free lines from employees seeking information about their next jobs.

The rules affecting crew scheduling are complex because CSX acquired about 46 different labor agreements from its predecessor companies relating to various categories of work performed by train crews. The TMC System incorporates all of these rules into its scheduling and crew-calling procedures.

Train Scheduling

Under CSX's Train Management Concept (TMC) every train has an assigned profile which includes an ID number, a nominal schedule and planned locations for engine and crew changes. Figure 2.3-2 shows a simplified schematic of the information flows in TMC. Each train is identified by a six-character alpha-numeric code. The first four characters are the permanent "name" of the train while the last two represent the date on which the train started from its terminal of origin. The system begins prompting the Yardmasters and Chief Dispatchers for a decision about whether and when a specific train will run about twelve hours before the departure time specified in its profile. Over the next several hours, the Operations Center Yard Masters and Chief Dispatchers decide which trains on the nominal schedule will run and at what times. When they reach a decision about the time to start a specific train, that information is passed to the crew-callers, at which point the train is officially authorized.

This authorization results in the creation of a "Train Sheet" containing the train's ID, crew data, loads, empties, power allocation, schedule of times it is expected to pass each station and crew-change times. The "hazard graph" is also created based upon the distribution and types of loads in the train.

The train's location is continuously monitored in real time as it travels its route. As each crew completes its portion of the run, the conductor enters a sequence of codes (typically about 25 key strokes) at a computer terminal to identify the crew, the time they went off-duty and any train-handling problems encountered. The system transmits this information automatically to employee-records files, payroll, etc.

Crew-Calling for Assigned Service

Many of the approximately 2,000 crew starts each day have assigned crews, especially for the yards and locals. However, the proportion varies widely according to the precedents set by the labor contracts and agreements of the predecessor companies. About 75% of the former L&N trains operate with assigned service while only about 10% of former B&O/C&O are so operated. Virtually all of the coal trains are unassigned.

The names of the assigned crew-members appear automatically on the crew-callers screens. For those trains which operate on a regular schedule, no calls are necessary unless a replacement is needed for a regular assigned person who is sick or vacationing. However, for most road trains, a call is necessary since the departure time is somewhat variable. On former L&N territory, assignments are defined by a plus-or-minus-three-hours time window. If the train is not ready to depart within this window, a worker may be used on a different train, but only if it departs within the same window as his original assignment.

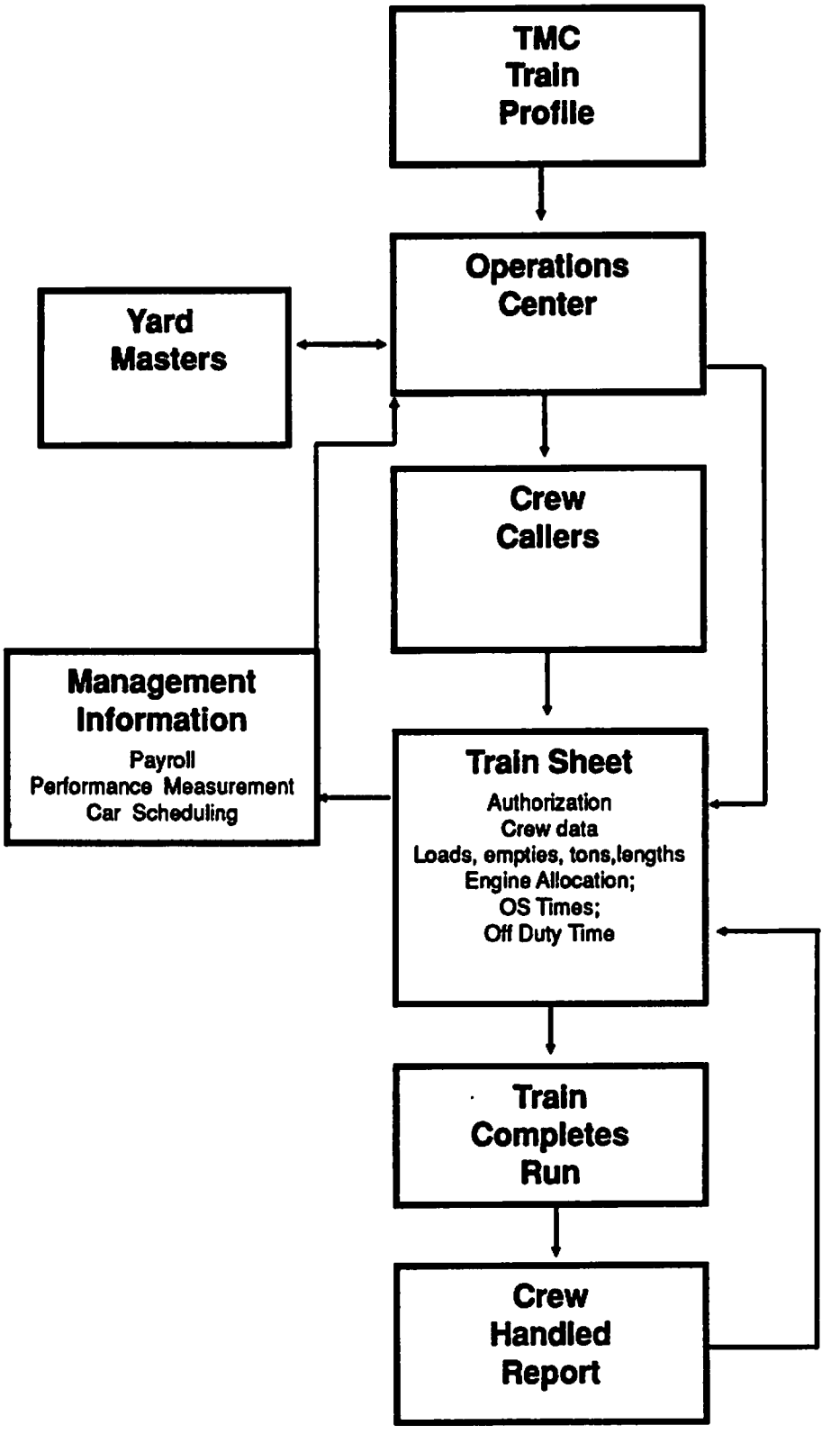


Figure 2.3-2: Simplified Flow Chart of the Train Management Concept (TMC) System.

Crew-Calling for Pool Crews

Depending on the division in question, a Yardmaster or Chief Dispatcher makes the decision as to when to call a crew for a given train. This decision is passed to the crew callers by the TMC System.

A crew caller will then see a screen similar to the printout shown in Figure 2.3-3, which shows the standings for a particular station for trainmen to work westbound trains. The caller works down the list until contact is made. Phone numbers, alternates, beeper numbers, etc. are all stored in the system and dialed by the computer. Information about rest status, vacations, regular days off, etc. are also presented on the crew-callers' screens.

```
MCMU.MCXI                    TRAINMEN WEST    INQUIRY            DATE 06/08/90 14:4
OPTION INQU      SPLY PT BF 270    EXB/POOL ID TRNBWCONGB PRT ____          PAGE 01
BOARD SELECTION: STANDING ORDER Y/N Y    SENIORITY ORDER Y/N __     OSL ORDER Y/N

SEQ B    EMPLOYEE      TRN          -DUE TO WORK -                          ASSOC
NO  S    ID   NAME     NUM  STA REA  OFF-DY  P  SP-PNT  ASGN CN REST-TO-WK  EMP-ID

001 N 041370 RE MILLER 018      MDY  FR-     Y                  RESTED
002 N 041541 CE HOOVER 005           WE-     Y                  RESTED
003 N 516884 GE NOLAN  011           WE-     Y                  RESTED
004 N 041360 DL STEWAR 001           MO-     Y                  RESTED
005 N 516879 JM OSLER  010      L24  TH-     Y                  RESTED
006 N 041076 TJ HAAS   008           SA-     Y                  06081530
007 N 040527 HG MOUNTA 002           MO-     Y                  06082000

001 F 041413 ER MELODI 016      VA1  TH-     Y
002 F 041545 RE BRYNER 012      VA1  TU-     Y
003 F 041539 EA SHALLE 019           MO-     Y  BF 270  FPWT 13
004 F 518746 JE SPICOL 003           TU-     Y  BF 270  FPWT 11
005 F 041535 FM HATTER 004           TU-     Y  BF 270  FPWT 05
006 F 041358 WJ WATSON 007      RES  FR-     Y
BOARD SIZE 0015 POS OPEN 0000
NEXT FUNCTION
MESSAGE    MSG 005: ADDITIONAL DATA (PA2:FORWARD,PA1:BACK)
```

Figure 2.3-3: Example of Crew Standings Printout.

Information Available to Employees

Train-crew employees who want information about when their next jobs are likely to be called have three means of inquiry available. Every CSX crew-change station is equipped with a computer terminal accessible to crew members and normally used by them to generate various reports. Crews going off duty normally check the system at that time.

An employee can see any of the types of information listed on the screen print shown in Figure 2.3-4. The data presented are automatically limited to the station from which the entry is made. Most commonly, the employee would want to see the train lineup for the next several hours (Figure 2.3-5) and compare it with the standings (example shown in Figure 2.3-3) to estimate when his next job is likely to be called. At this writing the train lineup data are available for only the next four hours, but the TMC software is currently being modified to show the tentative lineup for periods of as much as 24 hours ahead.

```
MCMU.MCAI                    T&E INQUIRY SELECTION MENU                    DATE 06/08/9
                                                                           TIME 14:46

SELECTION 27        SPLY PT BF 270 ASGN _____ PRESS PF13 FOR T&E MISC FUNCTIONS

YARD ASSIGNMENTS                ROAD ASSIGNMENTS                MISCELLANEOUS

01 - 1ST SFT                11 - ASSIGNED PASSENGER SERV    24 - EN EXBD/GUAR POOL
02 - 2ND SFT                12 - ENGR'S POOL PSGR SERV      25 - SW EXBD/GUAR POOL
03 - 3RD SFT                13 - FIRE POOL PSGR SERV        26 - MANNING TRN BD
04 - RELF JOBS              14 - COND POOL SERV             27 - TR EXBD/GUAR POOL
05 - HOST JOBS              15 - TMAN'S POOL PSGR SERV      28 - COND EXTRA BD
                            16 - LOCALS, EXTRAS             29 - FOREMANS EXTRA BD
GEN/LOC CHRM                17 - WORK TRAINS                30 - STATUS INQUIRY
----------------            18 - HELPERS / SWITCHTENDERS    31 - CREW POSITION INQ
06 - EMPL HIST              19 - ROAD SWITCHER ASGNS        32 - VACANCY INQUIRIES
07 - ASGN HIST              20 - ASSIGNED THRU FRT SERV     33 - OVERTIME LIST
08 - EXBD HIST              21 - ENGR'S POOL FRT SERV       34 - T&E MISC FUNCTIONS
09 - OSL HIST               22 - TMAN'S POOL FRT SERV
10 - ROSTERS                23 - CREW STANDINGS


PRESS PF18 FOR HELP
NEXT FUNCTION
MESSAGE MSG 351: ENTER SELECTION CODE
```

Figure 2.3-4: Example Menu of Types of Information Available to Crewmen through TMC Terminals.

```
TMMU TMLU                    ENROUTE LINE UP-INQUIRY                    DATE 06081453
OPTION INQU   PTR                                NAME
STATION BF 270 NEXT 08 HOURS    TYPE AA                LOCAL/SWITCHER N CALLED N

TRAIN      ESTIMATED      SCH    --LAST STATION DATA--      TRAIN          LENGTH
ID         ARRIVAL        DEPT   NAME          DATE/TIME    DESTN          IN FEET
R38107     0608  1100     1500   BA  178       0608  1115   TD BG  58      07484
R13607     0608  1530     1550   BG  204       0608  0515   TD BA  178     06287
R37606     0608  1655     1630   BG  58        0608  1155   TD BA  178     10091
R35308     0608  1630     1700   BA  178       -     -      - BG  58       -
R13808     0608  2110     2130   BG  204       0608  1140   TD BA  178     06322
R39708     0608  2245     2245   BAK  88       0608  0800   TD BG  58      03035
-          -     -        -      -             -     -      - -            -
-          -     -        -      -             -     -      - -            -
-          -     -        -      -             -     -      - -            -
-          -     -        -      -             -     -      - -            -
-          -     -        -      -             -     -      - -            -
-          -     -        -      -             -     -      - -            -
-          -     -        -      -             -     -      - -            -
-          -     -        -      -             -     -      - -            -
-          -     -        -      -             -     -      - -            -
-          -     -        -      -             -     -      - -            -
NEXT FUNCTION
MESSAGES M155 - INQUIRY COMPLETE
```

Figure 2.3-5: Example Train Lineup.

Away from a terminal, an employee has two options for checking the train lineup and his standing:

(1) He may telephone a crew-caller. Although management would prefer alternative methods because of the expense of staffing to handle these calls, there are still about 7,000 of them being received each day.

(2) An automated voice-response system which can deliver all of the information available on the terminal screens now handles about 13,000 calls per day. The information it offers is more detailed than that on the tape recorders it replaced and is updated continuously. It is most easily used from touch-tone phones, however CSX has recently installed a speech-recognition system in order to make this system accessible to employees in areas which do not yet have touch-tone service.

If the employee's standing and the train lineup suggest that he will likely be called to work on an intermodal or manifest train, the employee can plan his schedule with a relatively high degree of certainty as to timing, because these trains operate on schedule most of the time. Figure 2.3-6 shows that CSX intermodal trains have been operating within 30 minutes of their nominal schedules about 90% of the time in the past two years. Manifest trains are considered on schedule if they arrive in time to make connections with their corresponding outbound trains. This standard is now being met about 95% of the time as indicated in Figure 2.3-7. However, crews on coal and other bulk-commodity trains are subjected to much greater uncertainty as to when they will be called and how long the job will take.

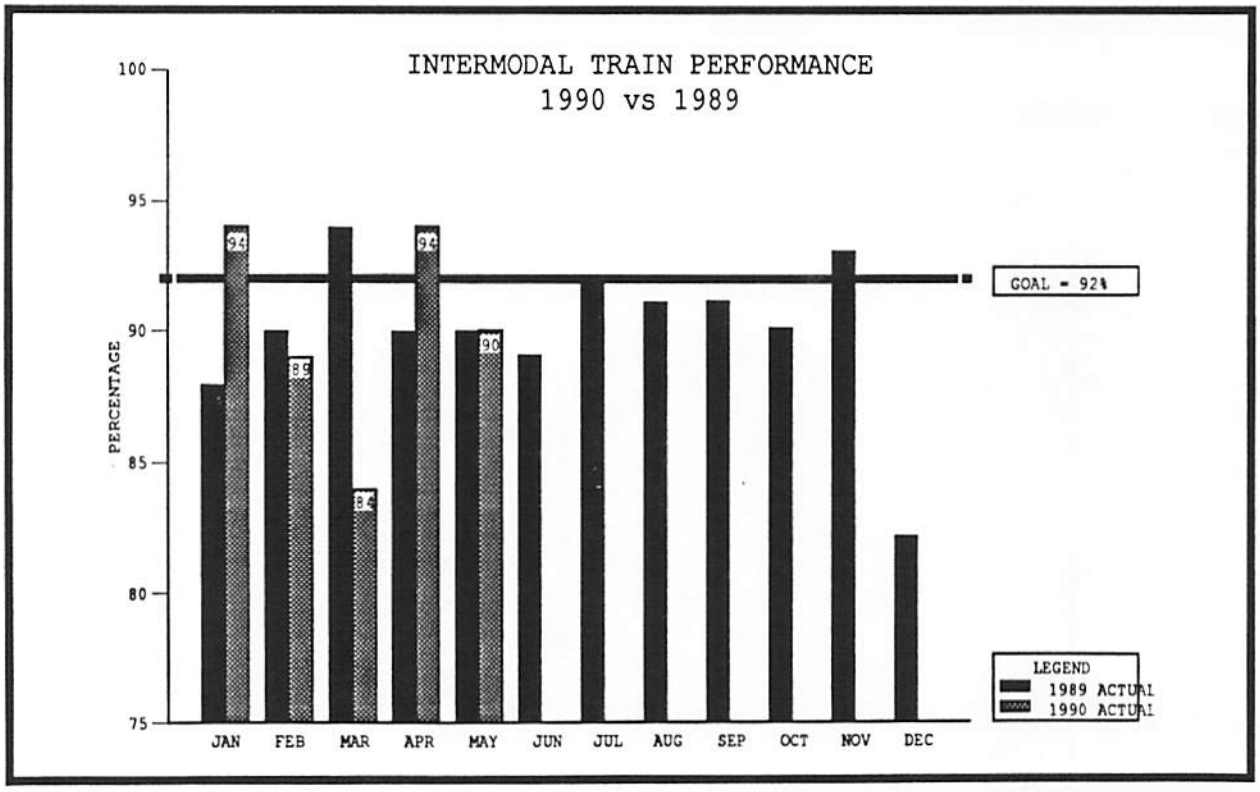


Figure 2.3-6: CSX Intermodal Train Performance, 1989 versus 1990.

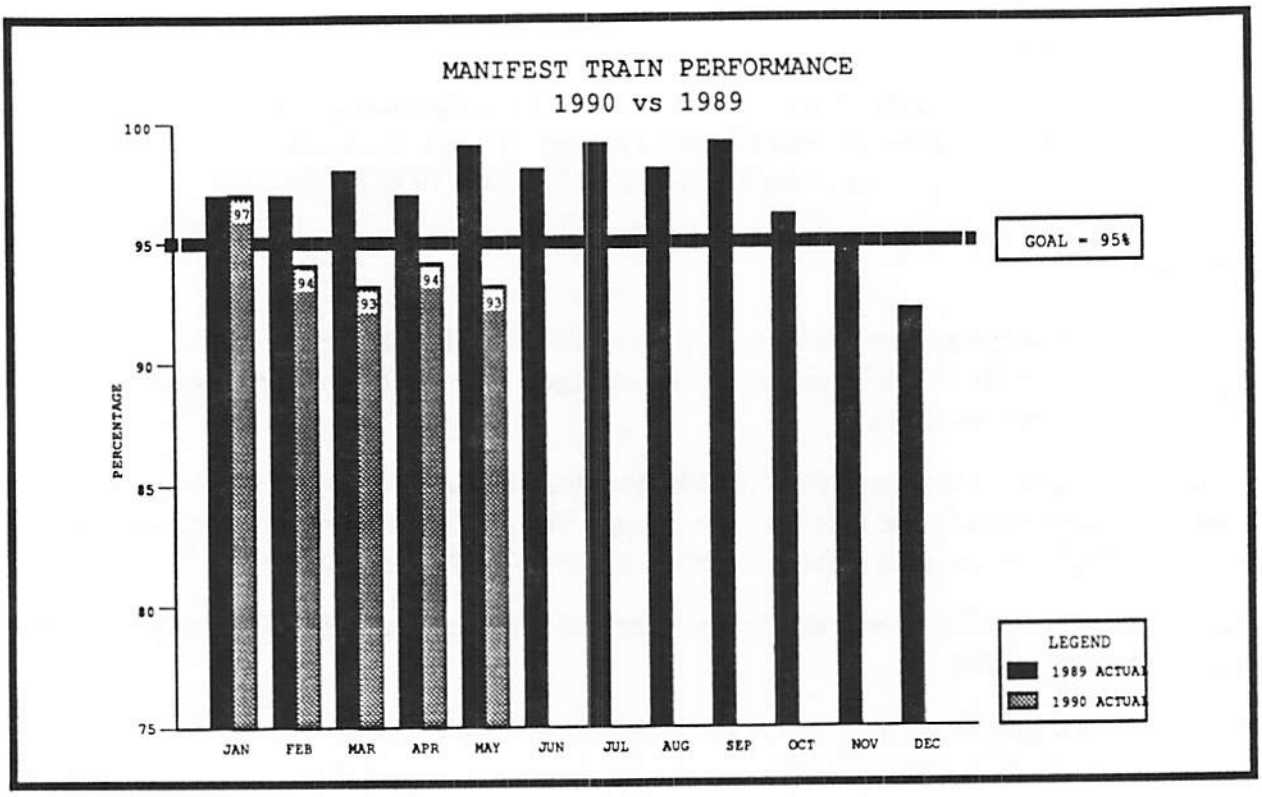


Figure 2.3-7: CSX Manifest Train Performance, 1989 versus 1990.

2.4 Illinois Central

Dispatching and crew calling for all of the IC are centralized in the Chicago area. 1,500 trainmen and enginemen are currently on the payroll to provide about 175 crews per day for a mix of jobs including six intermodal trains, 18 manifest freights, 25 locals, 80 switchers and road switchers, and 10 to 20 unit trains (coal & grain).

Train Dispatching

All road freights and switchers, except unit trains, have established schedules, referred to as the System Service Plan. Each day around 10 AM the senior operating managers convene by conference call to consider what schedule adjustments are necessary.

The result of this meeting is the "game plan," which describes only the extras, combinations, cancellations, and significant departure delays (i.e. greater than two hours). The game plan is normally updated at about 5 PM and again at midnight. When circumstances warrant, additional updates are prepared.

Because the dispatching office is several miles away from the crew-calling office, FAX is used to transmit the game plan to the crew callers.

Figure 2.4-1 shows a simplified flow chart of the decision-making process for dispatching.

Crew Calling

Six crew callers are on duty 'round the clock, seven days a week. One on each shift is designated lead caller, but also handles a normal calling workload. They report to the Manager of Crew Callers, who in turn reports to the Transportation Superintendent.

PS Technologies supplied the crew-calling software used by the IC, which runs on the railroad's mainframe. Figure 2.4-2 shows a typical caller's work station, while Figure 2.4-3 lists the menu of functions available. Typical examples of the types of information provided by the system include a listing of trains enroute to a given terminal (Figure 2.4-4), duty hours of the crew on a particular train (Figure 2.4-5), working hours of a particular crew or employee (Figure 2.4-6) or an employee's master record (Figure 2.4-7).

In addition to calling crews, the callers are also responsible for a number of other record-keeping activities, of which the most time consuming is preparing tie-up reports. These are currently based on telephoned reports from crews going off duty. A remote computer terminal to perform this function is now being evaluated. It will permit crews to enter the data from this report directly, thus reducing the callers' workload and speeding the flow of information.

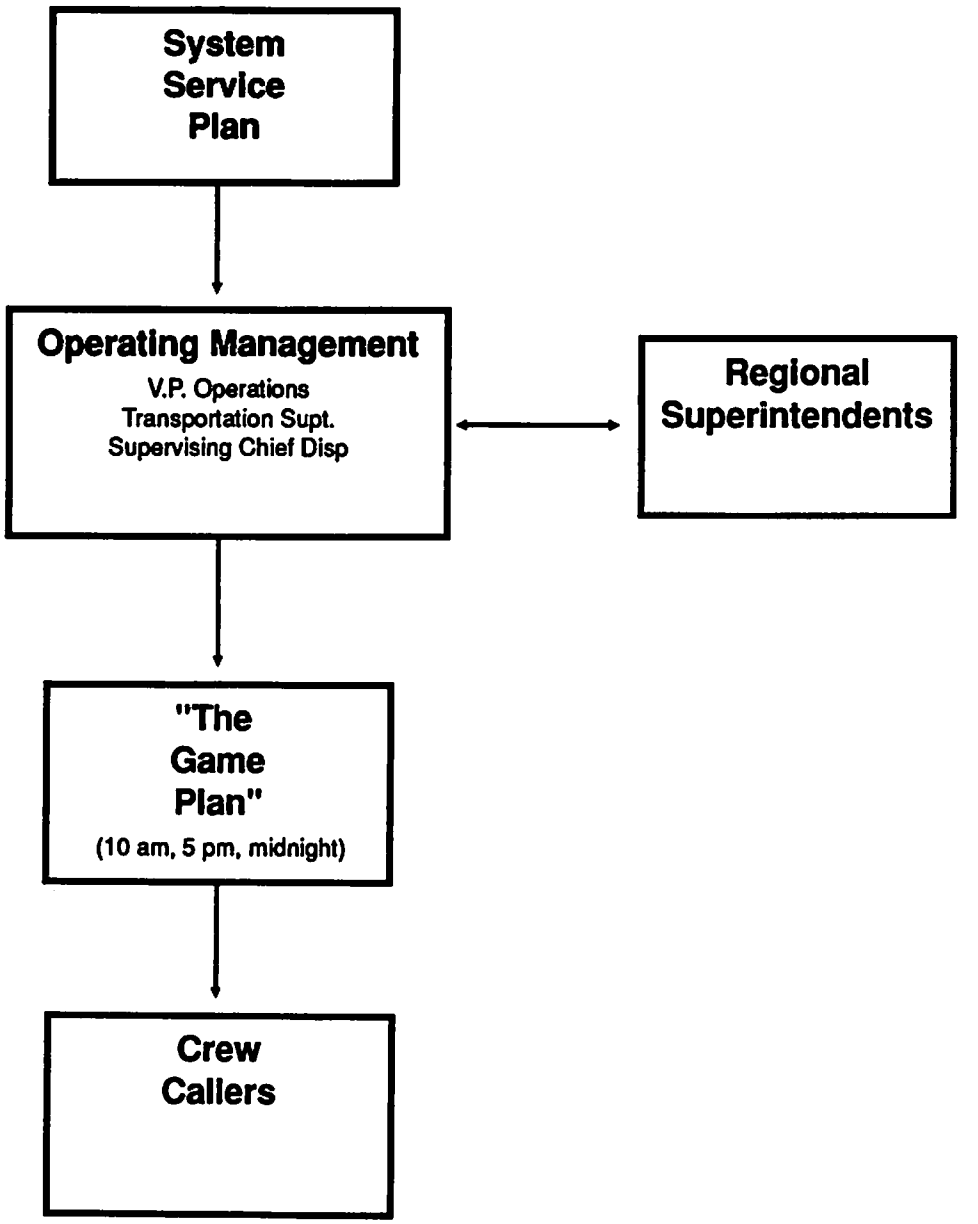


Figure 2.4-1: Simplified Chart of Information Flow on the Illinois Central.

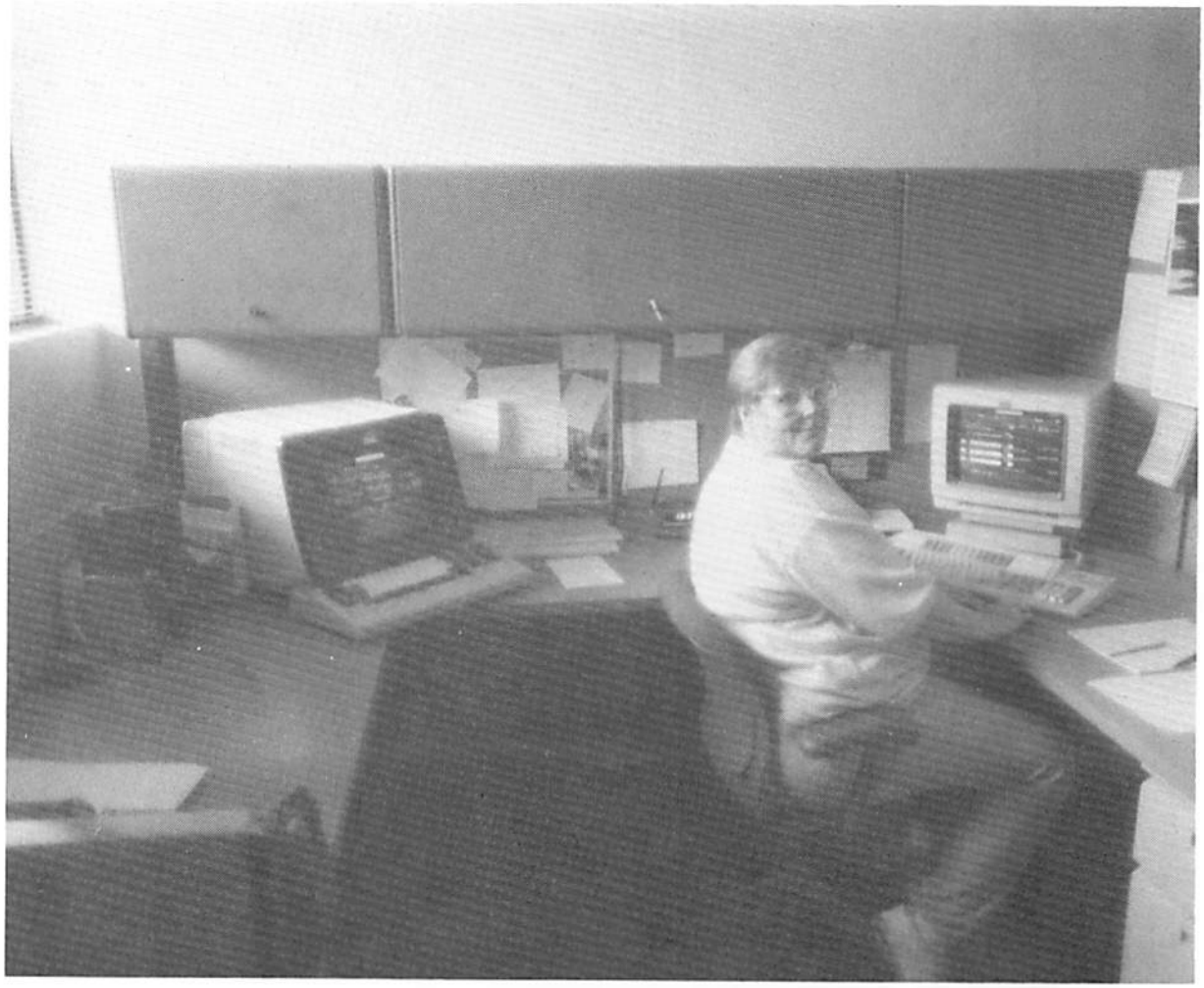


Figure 2.4-2: Crew Caller's Work Station on the IC.

Although the computerized system keeps track of a wealth of data relevant to calling and effectively eliminates some types of error, it cannot yet cope with all of the arcane provisions of the IC's labor agreements. Roughly two per cent of the crew callers' business is still done with manual procedures. For example, at one yard, the local agreement requires that yard crews be informed of their next jobs in person by a local clerk, rather than by telephone. At another yard, four helpers are required on certain jobs, although no more than two are used anywhere else on the system and the computer software allows for only two. Provisions related to "freezing" jobs on holidays at Markham Yard require the use of an old tag board to keep track of these special situations, illustrated in Figure 2.4-8. Management expects to deal with these situations by negotiating them out of future agreements rather than further complicating the software.

The rules embodied in formal and informal labor agreements are so extensive that no caller is expected to master them for more than a few districts. Thus each of the six callers on a given shift is specialized to a different portion of the railroad. No caller can substitute for another in a different region without extensive training. Hence minimizing turnover in the calling staff is very important in minimizing calling errors and subsequent grievances.

```
DIST: IL   TERM: CH              ILLINOIS CENTRAL                    PSTS03
                                CREW CALLER SELECTION MENU

01  CALL                                        01  UNASSIGNED ROAD SERVICE
02  TIE UP                                      02  ASSIGNED YARD/ROAD SERVICE
03  LAYOFF/MARKUP                               03  JOB BULLETINS
04  UPDATE/INQUIRY                              04  EMPLOYEE RECORDS
05  SENIORITY MOVE/DISPLACEMENT                 05  EXTRA-BOARD
06  CALL AND RELEASE                            06  REGISTER TO WORK REST-DAY
07  REPORT YARD ADJUSTMENTS                     07  DEADHEAD TO/FROM ASSIGNMENT
08  DAILY MARK PLACEMENTS

FIRST SELECTION:                                SECOND SELECTION:

01  FIELD INQUIRIES                            07  SHIFT REPORT
02  TRAIN HISTORY                               08  SHORT CREW REPORT
03  YARD HISTORY                                09  MISC REPORTS
04  LAYOFF RECORD BY CRAFT                      10  CREW PERFORMANCE REPORT
05  TURNOVER                                    11  CALL BOARD REPORT
06  EMPLOYEE WORK HISTORY                       12  ASSIGNMENT HISTORY

                                THIRD SELECTION:
SELECT A COMBINATION OF FIRST AND SECOND SELECTION OR THIRD SELECTION ONLY
```

Figure 2.4-3: Main Menu of Functions in the IC's Crew-Calling System.

```
                          ILLINOIS CENTRAL                                SCR34G
TIME:  12:17:03                 TRAINS ENROUTE                    DATE:  08/06/90
                          DISTRICT:  IL       TERMINAL:  CH
       CRAFT   TURN       ------ EMPLOYEE -------    DUTY   -------OWNED BY -------
TRAIN: 1CHG06 ON DUTY IN:  CHAMPAIGN   AT: 1115 ON: 08/06/90
       EN          AP01   BELSCAMPER, A. J. (TONY)

       CO          AP01   BURKE, B. B.
       B1          AP01   FRANCIS, R. E. (DICK)
       B2          AP01   MACK, W. D. (BILL)
TRAIN: 1CHN06 ON DUTY IN: CHAMPAIGN    AT: 0640 ON: 08/06/90
       EN          CP02   ROGERS, P. L. (PHIL)

       CO          CP12   MCDOWELL, J. E. (JERRY)
       B1          AL02   GRAMPP, T. R. (TOM)
       B2          AL02   TRINKLE, R. L. (ROGER)
TRAIN: 1RPE06 ON DUTY IN: CHAMPAIGN    AT: 1100 ON: 08/06/90
       EN          CP04   KOERNER, B. J. (BARRY)

       CO          AL14   PRICE, J. R. (JIM)
       B1          SP04   DUNCAN, W. H. (BILL)
       B2          SP04   DIAL, P. L. (PHIL)
                          ENTER = NEXT SCREEN        PF3 = EXIT
PRESS ENTER TO SEE ADDITIONAL TRAINS ENROUTE
```

Figure 2.4-4: Example of IC Train Lineups.

```
IL CH                              DP CH GANG -CHAMPAIGN                    SCR08X

TRAIN SYMBOL: XXXXXX      POOL: CP    IN-OUT: I   1   CALL-DATE: 080690   TIME: 1330

FUNC CC    NAME                          LO ON DUTY    RESTED    PD  NORMASG
       EN  TYLER, N. T. (NORM)                 1330                  RCPT90EN  032752
1-217-356-0199     PGR 1-800-602-0353 NEEDS CALL FOR 730AM SWT ENG
       1                                 CP07
       FI << NO MORE TURNS AVAILABLE           1330

       CO STROWMATT, L. L. (LYNDEL)      NT    1330                  RCPT90CO  626966
CHPN 217-897-1276
       1                                 AL06
       B1 PERRY, G. T. (GLENN)           NT    1330                  RCPT90B1  040592
1-217-643-2577
       1                                 AL06
       B2 << VACANCY >>                        1330                  RCPT90B2

       2                                 AL06  PIAT JR, E. A. (ED) BO  037816
1 U    1
              GENERATE CALL SLIP? (Y):   FUNC - ATNA; ATBU; RJIN; RJOH;
        CALL; FILL; LAYO; REJT; RJSU; RJNR; RJNW; RJNA; RJHO; HELP; CSPR; ANNU
```

Figure 2.4-5: Duty Hours of the Crew on an IC Train.

```
IL CH                              ILLINOIS CENTRAL
                                     TRAIN HISTORY                          PSTSTRB
                                  CP CH GANG CHAMPAIGN

                                   1NCH04 STATISTICS
      BLUFORD                                                  CHAMPAIGN
  ON DUTY       DEPARTED        ITD     ARRIVED        DESIGNATED SW  TIED UP       FTD
08/06/90-0100  08/06/90-0145  NONE  08/06/90-0635 08/06/90-0700   08/06/90-0700 NONE

 TIME WORKED       MILES  CARS   DHEA   INIT/FINAL    SW MILES LAP BACK MILES    48MN
 0600              0132   149    NONE         000                  000            N
                                  1NCH04 CREW MEMBERS
CR     -------CREW MEMBER ----------- X TURN LISTED PNLT  DUTY ITD FTD DHEA 1HR
EN WHITCHURCH, D. L. (DAVE)      026298 CP03  0100   0100  0600              N
CO SCOLES, D. R. (DENNIS)        031744 SP04  0100   0600                    N
COMMENTS: TO CHAMPAIGN
                        ENTER = NEXT TRAIN SELECTED; PF3 = EXIT

DIST: ILSUB DIST: CH               ILLINOIS CENTRAL                         PSTS18X
                                  EMPLOYEE WORK HISTORY
              EMPLOYEE NAME: WHITCHURCH, D. L. (DAVE) OR NUMBER: 026298
                    DATE RANGE: 080590 999999  ALTERNATE PRINTER:

TRANSACTION    HISTORY  NORMAL    EFFECTIVE      ARRIVAL        EMP     PO I  TIME
DATE-TIME      FUNCTION ASSIGNMT  DATE-TIME      TIME           AFFECT  OL O  WRKD
08/05/90 0816  TIE UP   1CRMO5EN 08/05/90-0800  08/05/90-0755  CP03    CP O  0815
         2316  CALL     1NCH04EN 08/06/90-0100                 CP03    CP O  0100
```

Figure 2.4-6: Working Hours of a Particular IC Crew (top) and a Single Member of that Crew (bottom).

```
DIST: IL   TERM: CH              ILLINOIS CENTRAL                          PSTS05
FUNCTION: ( I)              EMPLOYEE MASTER RECORD

EMPLOYEE NAME: GARLOCK, R. L. (RANDY)                      EMPLOYEE NO: 052876
      DATE OF SERVICE: 111979          SERVICE CRAFT: BK SSN:
      RETARDER:           FOREMAN: 11197901 YARDMASTER:
TELEPHONE NUMBERS (MISC INFO):                             TEMPORARY ROOM # :
1-217               UNLISTED-DON'T GIVE OUT
      ADDRESS: 1301 LAFAYETTE #8 MATTOON IL 61938   (M)
                          EMPLOYEE STATUS INFORMATION
LAYOFF STATUS: VO         LAYOFF TIME: 9007291706          MARKUP TIME: 9007190847
      REST DAYS:          PLEAVE DAYS: 00                  DAYS TAKEN: 06 900728
VACATION SCHEDULE: 1) 0226      2) 0730      3) 0806       4)     5)     6)
                          ASSIGNMENT INFORMATION
NORMAL ASSIGN: EXB 90BK         RESTED TIME: 9007272200    ARRIVAL TIME: 9007271325
TEMPORARY ASGN: OCCT01B2        PREVIOUS DTY: 0500         TIE-UP TIME: 9007271400
ON DUTY ASSIGN:                 ON DUTY TIME: 9007270900   TRACK TIME: 9008050115
ASSIGN DATE: 900723             SHIFT ALLOC:               TRACKING ASGN: OCCT01B2
                                   QUALIFICATIONS
                    -      -      -      -      -      -      -
                    -      -      -      -      -      -      -
                     PF3 = RETURN; PF11 = SENIORITY; PF12 = SCROLL
                FUNCTIONS: A = ADD; C = CHANGE; D = DELETE; I = INQUIRY
<< PRESS PF12 TO BROWSE >>
```

Figure 2.4-7: Example of an Employee Master Record.

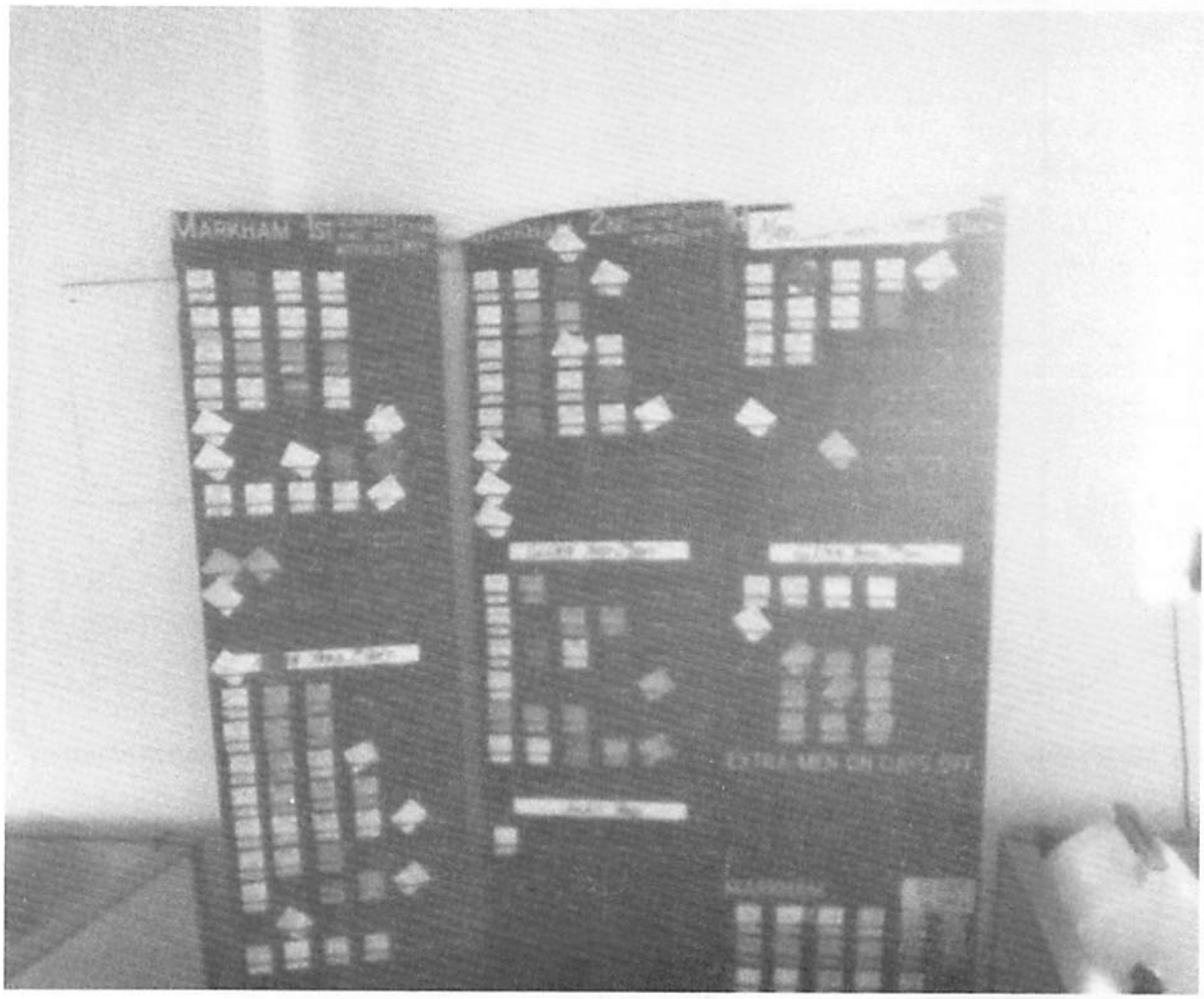


Figure 2.4-8: An Old Tag Board Is Still Used to Keep Track of Holiday Job Freezing at Markham Yard.

Information Available to Employees

At present information about lineups and standings is available to employees mainly by phoning the callers or the tape recorder through toll-free lines. This information will also be made available on computer terminals at crew-change stations in the near future. An automatic voice response system is under consideration, but the decision to install it has not yet been made.

Local chairmen have access to all information in the crew calling system through terminals in the district offices, but currently have no access through remote personal computers with modems.

As an overall average, about 90% of the IC's road freights leave their originating terminals on time (plus or minus one hour) and about 75% arrive at their final terminals on schedule to the same tolerance. These figures provide a good indication of accuracy of train lineups eight hours or more in advance.

2.5 Soo Line

The Soo Line Railroad is now entirely owned by the Canadian Pacific, but independently managed. As such its dispatching and crew-calling systems are drawn from several sources. It is currently installing a new dispatching system purchased from its parent. The crew-calling system was purchased from the DRGW, while its computerized time-keeping system is being developed in-house. These systems must all communicate, but some of the interfaces are not yet fully automated.

Most of its dispatching is done in Milwaukee. Chicago-area lines are the major exception, because commuter trains operating on its lines there must be handled in conjunction with Chicago Transit Authority dispatchers. The six territories controlled in Milwaukee are each dispatched from a separate room by a single dispatcher. Harmon CTC machines are used in some, while computerized track-warrant systems are used elsewhere. Figure 2.5-1 shows the Power Coordinator's board. A Harmon dispatching console appears in Figure 2.5-2.

The Soo Line requires about 180 to 200 crews per day. All crew calling is done from Milwaukee. Six callers are on duty during the first shift, while four are required on the second and third shifts, seven days a week.

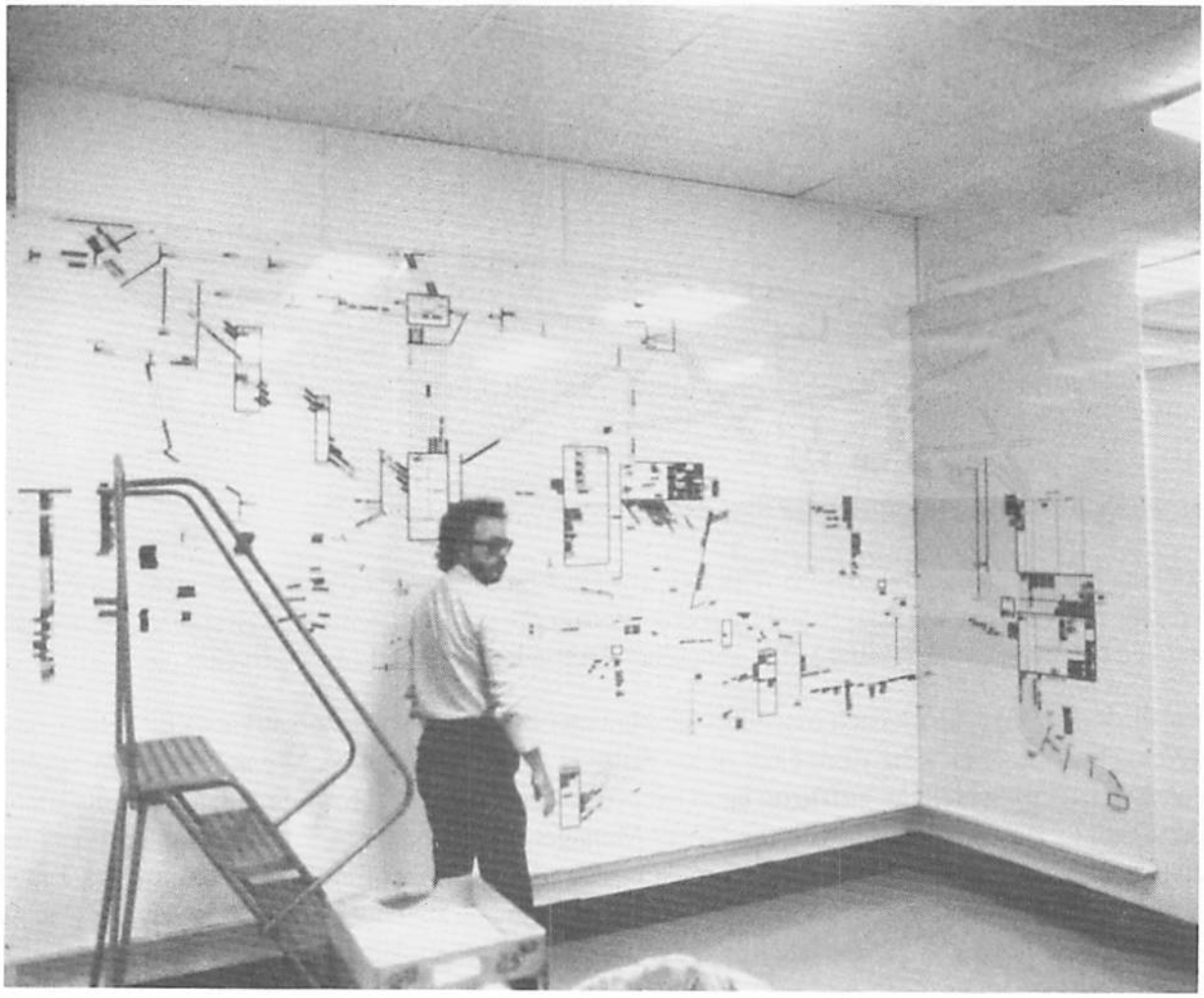


Figure 2.5-1: View of Power Coordinator's Board.

Figure 2.5-2: Harmon Dispatcher's Console.

Dispatching and Crew Calling for Road Freights

The process of train dispatching begins with the railroad's nominal schedule, referred to as the *Freight Train Manual.* These schedules are established by senior management based on marketing considerations. Recently the Soo Line has been adding trains as the Canadian Pacific has rerouted certain traffic.

Between six and seven o'clock each morning, the Manager of Train Dispatchers reviews the nominal schedule and the "exception counts" data from each of the railroad's major terminals. These "exception counts" show the number of cars by which the traffic on hand exceeds or falls short of the nominal length of the trains on the nominal schedule. In consultation with the Power Manager, the Manager of Train Dispatchers decides which trains to cancel or combine and where extras must be run. Movements of grain and coal trains are next added to the day's schedule. Finally, the outlying, low-volume terminals are checked to see if they have any unusual traffic which could not be accommodated by the trains already scheduled.

The results of this decision making are recorded in the "Turnover Report," which is prepared each day about 9 AM and revised about 11 PM. Figure 2.5-3 contains an excerpt form one of these reports. About 70 persons receive this report electronically, including all of the dispatchers, yardmasters and crew callers.

Based on the "Turnover Report," the information about train movements displayed on their consoles, and their radio conversations with train crews, the dispatchers update their lineups at least once per shift. These lineups are passed on to the crew dispatcher on paper. This entire process is summarized in Figure 2.5-4.

```
FROM: SYSTEM DISPATCH     TO: D.J. HANSEN     DATE: 90-07-11

SUBJECT: DAY TURNOVER JULY 11

ST PAUL TO BENSENVILLE

950-9 MILW 450AM WITH 28 CSX 42 CHGOS.

1/484 PORTAGE 505AM WITH 85 IC REMY GRAIN THRU TO GLEN YARD POWER AND CAB BACK TO
BVILLE.

2/484 PORTAGE 525AM WITH 75 DECATUR IND CR GRAIN FILL ON CRS AT MILW AND OUT WITH
115 CRS.

202 OUT OF PORTAGE WITH 81 CHGOS THRU TO BVILLE.

402/940 ST PAUL ABOUT 12PM WITH 12 NS 42 CRS 38 COKE AT MILW SET OUT THE 42 CRS AND
38 COKE AND FILL ON NS.
402 OUT OF MILW WITH ABOUT 20 NS PICK UP AT RONDOUT AND THRU TO CLAUMET.

ST PAUL TO STINSON AND POKEGEMA

401 ST PAUL ABOUT 1PM WITH 71 DWPS THRU TO POKY.

77 ST PAUL ABOUT 3PM WITH 70 SUPERIORS.

402 POKY CALLED FOR 845AM WITH 102 & 10 THRU TO ST PAUL.

76 WILL NOT RUN OUT OF STINSON TODAY.
```

Figure 2.5-3: Excerpt from a "Turnover Report."

The crew dispatcher types in the lineups so that the information will be available on the callers' screens and also available to the voice-response system. Figures 2.5-5, 2.5-6, and 2.5-7 show examples of the types of information available on callers' screens and through the computerized voice-response system, which was installed in February, 1990. The voice-response system is tone actuated, but tone pads can be purchased at low cost by employees who have only rotary-dial phones.

At present the voice-response system does not provide as much detail as the callers' screens. In particular, the standings do not include the names of the individuals ahead of the caller, although management plans to add this information. Standings are now updated in real time, but train lineups are often several hours old. Approximately two to three years will be required to network all of the systems so that all information will flow in real time.

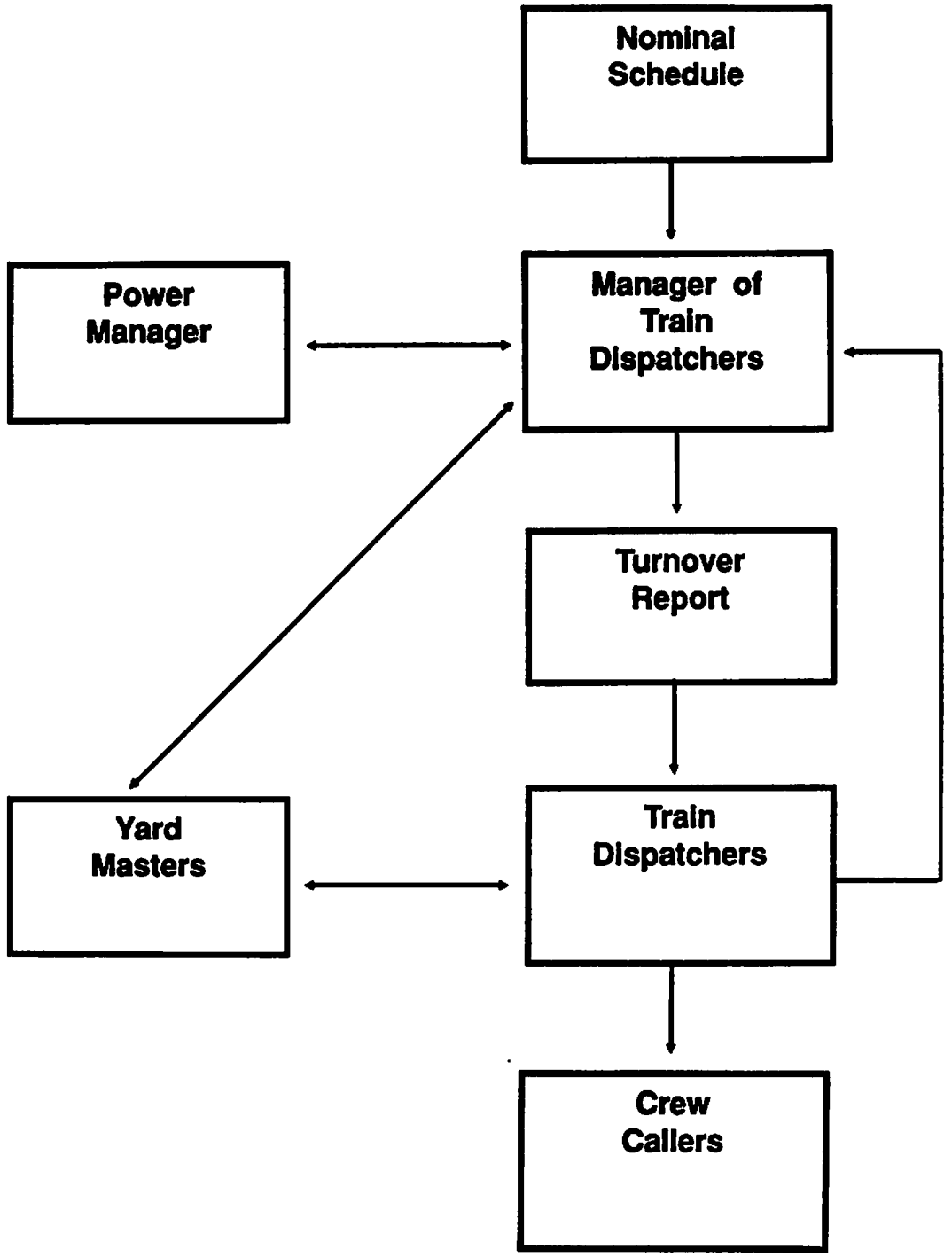


Figure 2.5-4: Summary Flow Chart for Dispatching and Crew Calling on the Soo Line.

```
O MI                        FREIGHT POOL MAINTENANCE                    PSTS15X

POOL ( CM )        FUNCTION ( I )              BOARD ( H )   (H=HOME; A=AWAY; T=TURN)

TURN POS           NAME                        LO

EN SC02    01      HEIMERMAN, H.J. (RED) CS02                                    N
FI SC02    01            OPEN
CO CM08    01      KAEMPFER, M.P. (MARK)       J3
B1 CM08    01      MURRY, G.D. (GERRY)
B2 CM08    01            OPEN

EN SC11    02      RODGERS, H.E. (HAROLD)                                        N
FI SC11    02            OPEN
CO CM06    02      GLASSMAKER, J.S. (JOHN)                                       N
B1 CM06    02      FULLER, D.F. (DAVE) 332
B2 CM06    02            OPEN

EN SC08    04      BRENNAND, M.D. (MIKE)       CS08
FI SC08    04            OPEN
CO CM12    04      BURBRIDGE, F.J. (JOHN)                                          S
B1 CM12    04      VERONA, A.J. (TONY)
B2 CM12    04            OPEN

I      PFKEY3 => EXIT:    PFKEY11 = >REPOSITION BOARD:      PFKEY12 = >SCROLL
```

Figure 2.5-5: Crew Caller's Screen Showing Standings.

```
                          EMPLOYEE MASTER RECORD                          PSTS05
FUNCTION: ( I )                                          DIST: NO SUB-DIST: MI

EMPLOYEE NAME: HEIMERMAN, H.J. (RED) CS02 ROAD: A4       EMPLOYEE NO: 000000

SSN:                BIRTHDATE: 050356   DOS: 050356      SERVICE CRAFT: EN
TELEPHONE NUMBERS (MISC INFO):                           TEMPORARY PAGER:
414-       414-             BPR                          OK 202 & 203
       ADDRESS:  220 18TH ST FOND DU LAC WI 54935

                     EMPLOYEE STATUS INFORMATION
LAYOFF STATUS: AO          LAYOFF TIME: 0721900315       MRK-UP TIME: 0805900912
REST DAYS: -
PERSONAL LEAVE DAYS:       BALANCE: 10   TAKEN: 00   VACATION WEEKS DUE: 5

                           ASSIGNMENT INFORMATION
NORMAL ASSIGNMENT: CMSC02 - EN  CM     POOL              ASGN DATE: 080590
TEMP ASSIGNMENTS:  -       DATE:
                                -

ON DUTY ASSIGNMENT:             -
LAST ASSIGNMENT:                -

ON DUTY TIME: 0806900900        ARRIVAL TIME: 0806901700   TIE-UP TIME: 0806901900
PREVIOUS DUTY: 1000             RESTED TIME: 0807900300

VACATION SCHEDULE: 1) 07/22/90  2) 07/29/90  3) 11/11/90  4) 11/18/90  5) 12/23/90
 ( FUNCTION: A = ADD:       C = CHANGE:   D = DELETE:   I = INQUIRY:        E = END )
```

Figure 2.5-6: Example of Employee Data Available on Caller's Screen.

```
                                                                    PSTSY2
                                TRAIN LINE UP
DIST: NO   SUB-DIST:      MI
POOL: CM   TERMINAL:      (H-HOME, A=AWAY, B=ALT-AWAY, BLANK=ALL)
FUNCTION   POOL      TERM        TRAIN        DATE          TIME
(A.C.D)     ID      (H.A.B)       ID        (YR MO DY)    (HR MN)

           CM          A         213-07       90 08 07      18 00
           CM          A         401-07       90 08 07      20 30
           CM          A         243-07       90 08 07      21 00
           CM          A         941-07       90 08 07      23 15
           CM          A         203-08       90 08 08      03 00
           CM          H         204-07       90 08 07      19 00
           CM          H         402-08       90 08 08      01 00
           CM          H         212-08       90 08 08      01 30
           CM          H         940-08       90 08 08      02 00
           CM          H         242-08       90 08 08      03 00
           CM          H         950-08       90 08 08      04 00
           CM          H         208-08       90 08 08      06 30
           CM          H         202-08       90 08 08      11 00


    RECORDS DISPLAYED MATCHING GIVEN PARAMETERS
 FUNCTIONS:  A=ADD,  C=CHANGE,   D=DELETE     PFKEY8=> SCROLL and PROCESS FUNCTION
 ENTER => INQUIRE or PROCESS FUNCTION         PFKEY3 => EXIT
```

Figure 2.5-7: Train Lineups as Shown on a Caller's Screen.

Yard Service and Local Freight

Crews on yard engines and local freights have assignments with regular hours that tend to be stable over many months and sometimes years. Although the pay is not as good as most road work, the hours are predictable, most of the work is done during daylight, and a worker can spend much more time with family. These jobs are bid off on the basis of seniority and many workers are happy to tradeoff the extra pay of road work for the other advantages of yard work.

By labor agreement, yard jobs usually start between 0630 and 0759 for the first shift, 1430 and 1559 for the second shift, or 2230 and 2359 for the third. However, with the agreement of the local chairman, a different starting time may be established for a specific job. Since these are recurring jobs, they are posted on the bulletin board at least one day in advance. Usually no telephone calls are made for these jobs , unless someone from an extra board is needed to replace the person regularly assigned.

2.6 Southern Pacific

The Southern Pacific requires about 500 crews for through freights, about 280 for locals and road switchers, and about 320 for yard service each day. Approximately 7142 trainmen, enginemen and yard service employees are on the payroll.

Train dispatching and crew calling for districts east of El Paso are done from Houston. Roseville, California handles all districts to the west. The DRG&W subsidiary retains its own dispatching and calling activities. The Roseville Center, whose managers supplied much of the information for this report, was brought on line in June 1989, in temporary buildings. Relocation to a permanent building is planned during 1991. The Houston Center, was brought on line July 1989 in remodeled offices.

There are four systems that support the train dispatching and crew calling center. They are:

DIGICON	-	Train Dispatching
TOPS	-	Interyard reporting control system
TCC	-	Yard inventory/reporting system
CCATS	-	Crew calling and time keeping system

Train Dispatching

Dispatching at Roseville is done at 18 work stations like the one shown in Figure 2.6-1, using a software system developed by Digital Concepts called DIGICON. There is one dispatcher on duty per district. Eleven assistant chief dispatchers supervise this work, balance crews and perform other related functions.

Dispatching at Houston is done at 14 work stations. There are five chief dispatchers.

One of the two 19" monitors at each work station displays an overview of the trains for that dispatch district. The second 19" monitor is used to zoom in on a particular segment of track and control switches and signals. Today, this system requires very little data entry by train dispatchers. The system automatically passes data between districts.

The dispatcher also has two other terminals. The small "AVTEC" monitor is a touch screen to control communication links. The other screen is connected to the SP developed TOPS/TCC systems.

The purpose of TOPS is to track the location and status of trains, locomotives, cars/vans, crews and waybill data between yards. The purpose of TCC is to maintain a standing track order to trains, locomotives and cars and cars within yards. Today, O/S data (referring to the time a given train passed a specified station or control point) from DIGICON is sent real time to TOPS/TCC to update the ETA's of trains.

The SP maintains timetables for most trains (known as schedule 26 or simply the "train schedule"). These are incorporated in TOPS but not in the DIGICON system.

Decisions about which trains will run at what hours are based on "the train schedule" and consensus of assistant chief train dispatchers, train dispatchers, the power chief at the center, roundhouse personnel and yard masters at larger yards. This is based on several conference calls. Figure 2.6-2 illustrates the decision process.

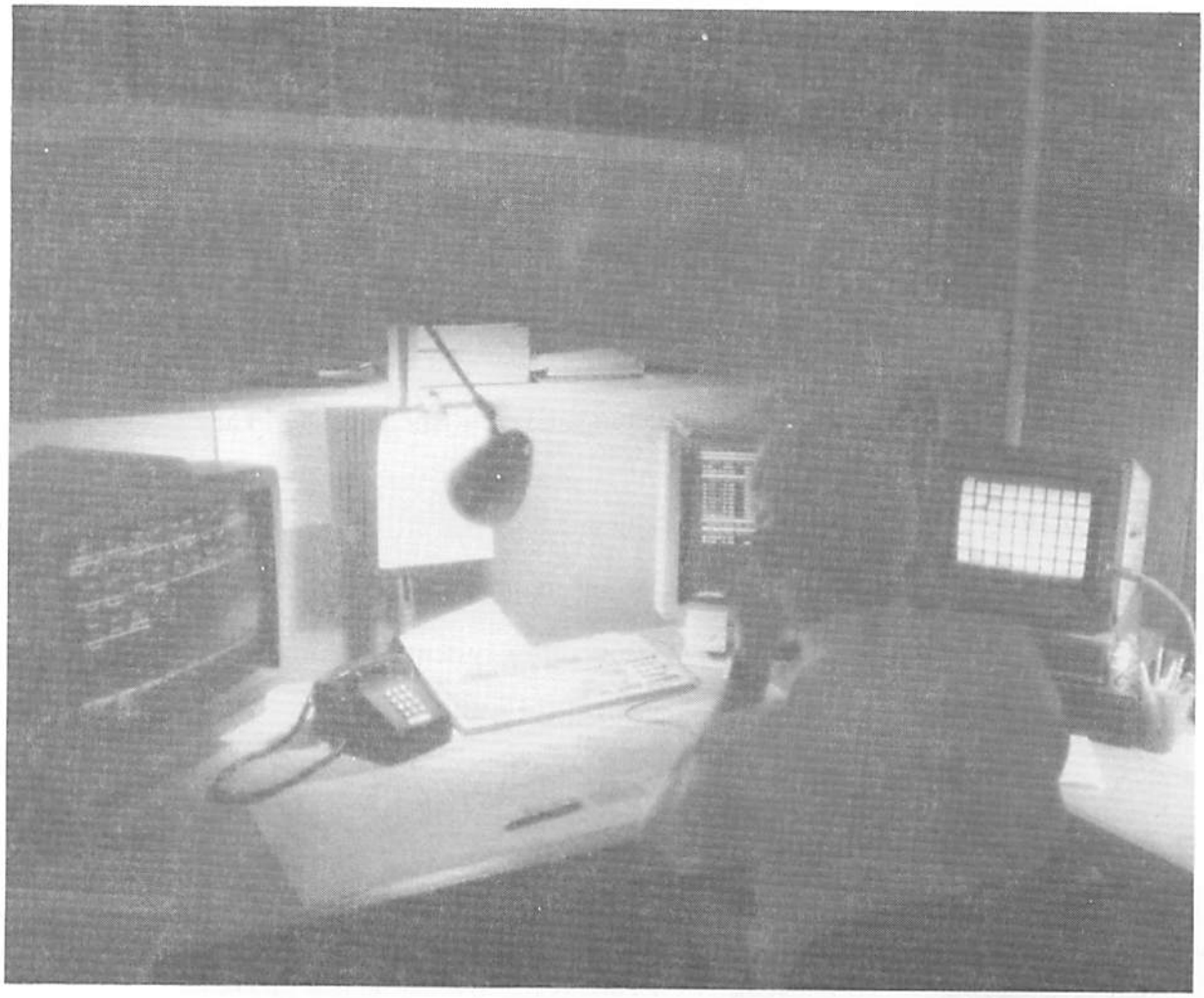


Figure 2.6-1: Dispatcher's Work Station on the Southern Pacific.

Dispatching is a continuous process. The daily planning cycle begins each morning with a report generated by TOPS, which shows the location of each primary train. The "delay report" shows the estimated times of arrival for each train. More detailed information about any particular train is available on request. For example, Figure 2.6-3 contains a description of the progress of a train designated "2BNSZT06," a container train operated for Sea-Land. Actual arrival and departure times are shown for selected stations already passed at the time the report was generated and estimated times are given for the remaining stations.

These estimates are based on a nominal, static schedule such as that shown in Figure 2.6-4, and do not take into consideration the train's actual HP/ton, slow orders, etc. However, the use of DIGICON O/S times in TOPS to adjust ETAs has significantly improved the TOPS ETAs during the second half of 1990. These TOPS ETAs will be further refined in 1991. Also, installation of upgrades in 1991 to DIGICON are being considered to project speeds based on actual conditions in real time.

As with other carriers, locomotive power failures, delays caused by track work and a variety of minor equipment problems are perturbing the schedules of a substantial number of trains. As a result, some trains are as much as four hours late in reaching their final terminals as compared with their nominal running times.

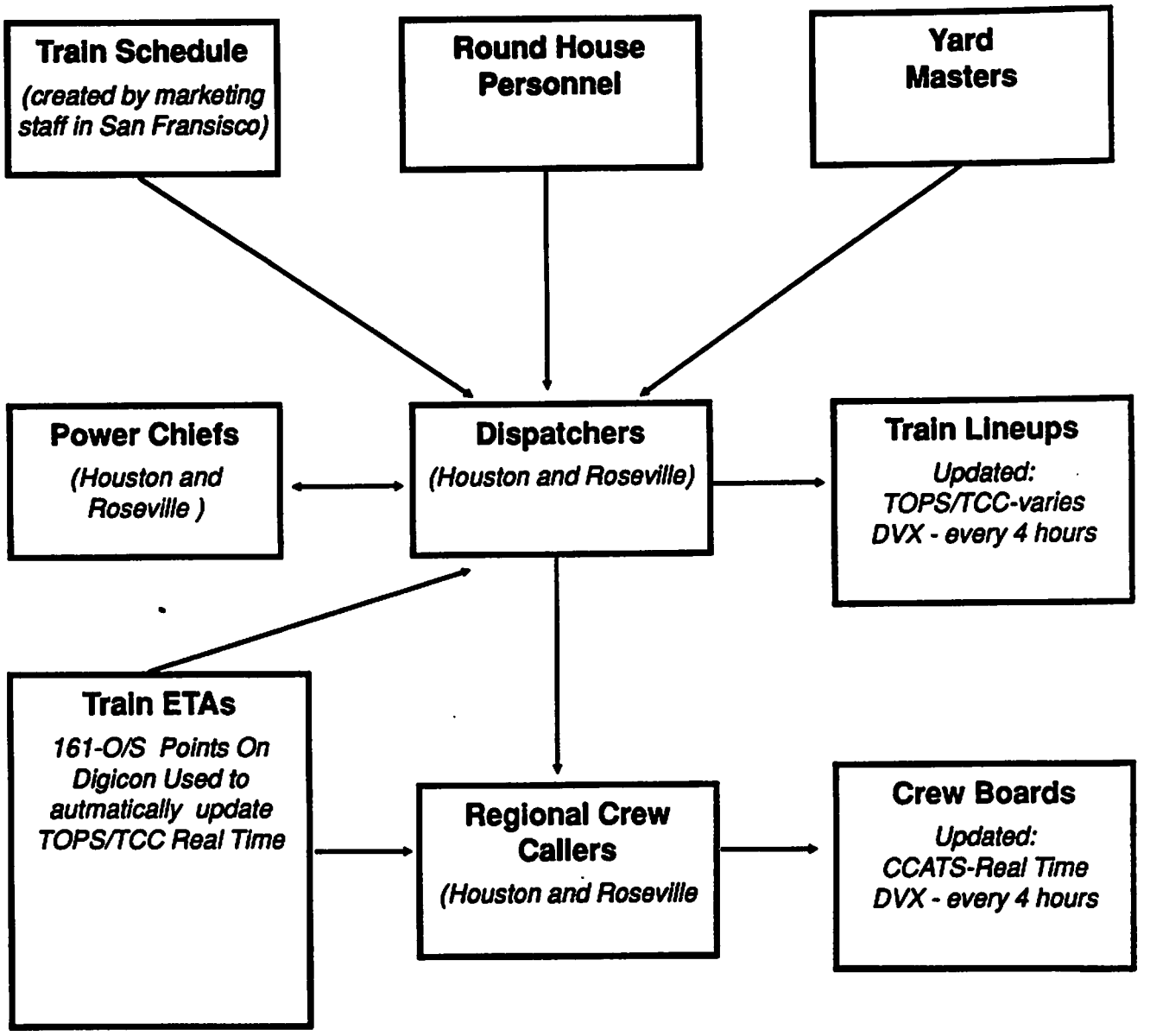


Figure 2.6-2: Overview of SP Train and Crew Dispatching.

```
MC98400 0 6 1417 08/09/90 U647  KZ N564 SP    CC98400
       INPUT DEVICE CC98400     SEQUENCE NUMBER 091

TRAIN INQUIRY RESPONSE

2BNSZT 06          *SEALAND*          W59          9520

DEPT MARTINEZ      1317 09
       008 HRS 07 MIN LATE
                                  NOW AT STATION COUNT  38
01 07800                                                          ROPER
           DEP      0400   08          068/LD 000/MTY 05924/TON 05407/FT 04/ENG
           REPORTED               -     ALL ORIGIN REPORTINGS
03 07696   OSA 0527  08              EDT 0528 08  REPORTING STN :07800: GRATOWER
           REPORTED               -     NONE REQUIRED
05 07500   ARR 0820  08                                                 GDEN
           DEP      0920   08          071/LD 000/MTY 06270/TON 05593/FT 04/ENG
           REPORTED               -     ALL REPORTINGS
07 07445   ETA 0945        08          REPORTING STN :07500: LITMT
           OSD      0935   08          071/LD 000/MTY 06270/TON 05593/FT 04/ENG
           REPORTED               -     NONE REQUIRED
09 07383   OSA 1103        08          REPORTING STN :07500: GROOME
           OSD      1105   08          071/LD 000/MTY 06270/TON 05593/FT 04/ENG
           REPORTED               -     NONE REQUIRED
```

Figure 2.6-3: Example of SP Train Inquiry Report.

```
1430 08/09 PRINT FROM CA98400
                    806 - ADD/DELETE/CHANGE D1260 TRAIN SCHEDULE
OPTION  SCHLID      NAME                                              DRGWID  ACT
   @      NNNN      @@@@@@                                            @@@@@@   @
   P      9520      BNSZT                                               41-
SCHEDULE HEADER DATA:
S  OPER    FIRST    LAST    SCHL   DLY  COMMON     BLL    TRN   STK
E  DAY     DATE     DATE    CLS    CALC NAME       TIME   MSTR  TRN
Q          MMDDYY   MMDDYY                         CODE   Y/N
01 XXXXXX  100189   999999  A       1   *SEALAND* 0000
ORIGIN STATION:
S  STN     DEPT     I       SCHL   NML  MIL  DIR  DN   ADV  HOL ALT ONJCT ON     C A
E  NBR     TIME     N       RUN    RUN  TO   LV   IX   CST  SVC RTE RUN   DUTY   R G
Q                   C       TIME   TIME NXT  STN  VT                THRU   STN    W R
02 62100   1230     0       0200   0200 068  S    RR    O
TERMINATING STATION:
S  STN  DIR  CT    OFFJC  OFF  C   RTE  RTE    AUT
E  NBR  ARR  SF    RUN    DUTY R   DIR         SPT
Q       STN  TC    THRU   STN  W
03 12000 N    3                      1    3
INTERMEDIATE STATION:
S  C STN   SCHL NML  SCHL  NML   MIL AD DN  ACT DLY  PWR  CRW  WHL  A  A  RTE  RTE   A
E  D NBR   STN  STN  RUN   RUN   TO  RE IX  DSF CAL  OFF  CHG  CHG  R  S  DIR       G
Q  E       TIME TIME TIME  TIME  NXT RP VT  VTC
04  60100  0005 0005 0255  0255  081 NS RR  04   1    0    0    1         1     9
05  60000  0015 0015 0330  0330  147 NW RT  18   0    0    1    1         1     9
```

Figure 2.6-4: Example of an SP Train Schedule Input Form.

Crew Calling

For the western region, 19 crew callers plus one chief are required for each shift to call about 425 crews per day from among about 4,000 trainmen, enginemen and yard employees. Of these crews, about 280 are for through freights.

For the eastern region, 13 crew callers plus one chief are required for each shift to call about 461 crews per day from among about 3,142 trainmen, enginemen and yard employees, of which, about 175 are for through freights.

At present, calls for crews are in response to telephone calls from train dispatchers, which the crew callers log in a notebook. Callers receive their lineups on paper, with updates about every four hours.

The callers use computer terminals like those shown in Figure 2.6-6 running software originally developed by the DRG&W. On the SP it is called CCATS (crew-calling and time-keeping system). CCATS provides the menu of functions illustrated in Figure 2.6-7. To call a pool crew for example, the caller selects option 11, then keys in the district, pool designation, train symbol and on-duty time on the screen shown in Figure 2.6-8. CCATS completes the screen with the names of the first-out crew members in each craft, along with telephone number and other pertinent data. Actual dialing is still manual, but alternative numbers are automatically displayed.

Callers are authorized to grant rest beyond HSA requirements of up to 12 hours. They report that this provision is widely used by extra-board employees to avoid yard jobs and is also invoked disproportionately on weekends. Some pools are afforded the option of 28 to 48 hours rest.

```
MC98400 0 2 1421 08/09/90 U651  NN     N198   SP     CA98400
          POWER/CAB REPORT FOR CARLIN 1421   08/09/90

           TRAINS DUE TO ARRIVE/DEPART WITHIN NEXT 24 HOURS
TRAINS ARRIVING - NOW  PAST  LAST  REGULAR  ENG  CHANGE  POINT   PRIOR  THIS  STN
EAST              UNITS  PIT    P  SERVICD  NXFRA  SLF   MAINT  DST  S  OIB/O     B

 1ROEUM    09                                          CARS-  16/    32/    2697/  3203

  ETA 1355 09      SP     8308 0726 4 SSL0808 Q0927 0816 M06  0927  EU  N  CC      F
  DP  OGDEN         0700
                   TS-TRACKSTAR RADIO  TB-TELEM      BOTH   SYST
                   SP     7320 0804 5 SSL0808 Q0831 0901 M03  0831  EU  N  CC      B
                   TB-TELEM BOTH SYST  RC-WASH RADIATORS
  6000-OK  HP      2.22 HPT CABS-  SPHP  9151
 1ROOAM    09                                          CARS-  38/    45/    6186/  4823

  ETA 1451 09      SP     6830 0803 5 SSL0808 Q1017 0901 M06  1017  RV  N  OK      F
  DP VALPASS       1439
                   2B-EVENTREC TEBOTH  TS-TRACKSTAR RADIO
                   SP     8329 0805 7 SSL0808 B0908 0908*M06  0908  RV  N  CC      F
                   TB- TELEM BOTH SYST TS-TRACKSTAR RADIO
                   RC-WASH RADIATORS
                   SP     8280 0807 7 SSL0808 Q1003 0818 M03  1003  RV  N  OK      F
                   GA-DEF AIR CONDIT   2B-EVENTREC TEBOTH
                   TS-TRACKSTAR RADIO
  9600-OK HP       1.55 HPT CABS-      SPEP   90167
```

Figure 2.6-5: Example of an SP Power/Cab Report.

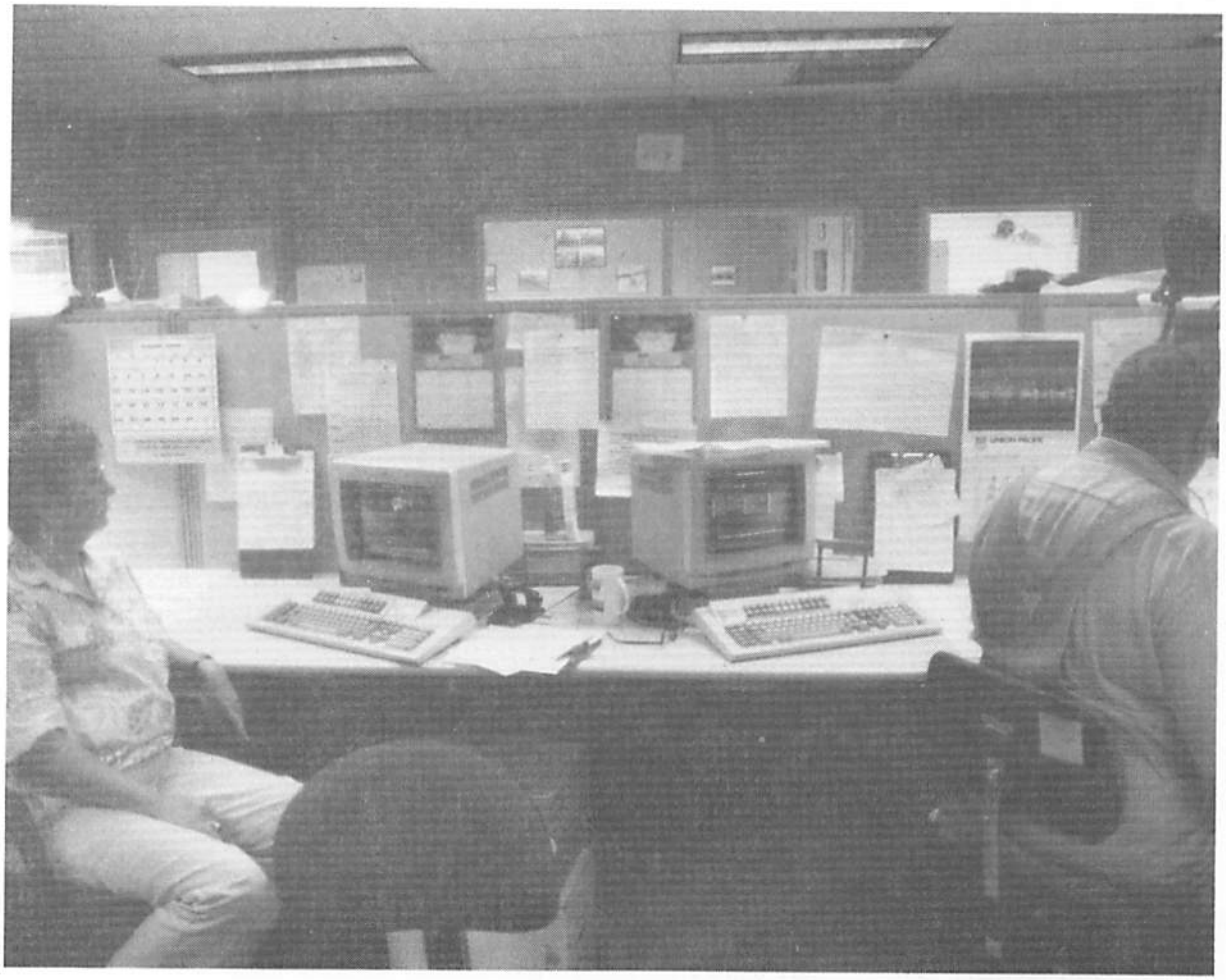


Figure 2.6-6: Southern Pacific Crew Caller's Work Stations.

Information Available to Employees

Information about board standings and train lineups is now disseminated to employees through a computer telephone system or through computer terminals. The telephone system, marketed by Wang Laboratories, called DVX, is currently handling about 15,000 calls per day at Roseville and 11,000 calls per day at Houston. Today, inputs to DVX are updated only about every four hours so it functions like a conventional tape system.

SP supplies beepers, when appropriate, to its operating employees when they are away from home and provides the usual toll-free access to the crew-callers.

CCATS terminals have been installed at all crew-change points. These allow employees to see most of the information relevant to them. The board standing information is updated in real time and is quite complete. Other employee related data, such as time slip data (month to date), is available as a CCATS inquiry.

As with other railroads, the lack of current train lineups is a problem to individual crew members, the train dispatch and crew-dispatch center and field personnel. This problem has been given top priority for systems integration and programming to provide more "real time" information, delivered via the most assessable media.

```
CDB010                    CREW DISPATCHERS SELECT MENU      08/09/90 16:25:15 BA98505
                    SELECT: 18                    DISTRICT: LA
01 ASSIGNED JOB CALL            11 FREIGHT POOL CALL        21 LAYOFF AND MARKUP
02 CALL LOCAL/RD SWITCHERS      12 FREIGHT POOL TIEUP       22 SENIORITY MOVE DISPLCMT
03 ASSIGNED JOB TIEUP           13 FREIGHT POOL RELEASE     23 EXTRABOARD MAINTENANCE
04 ASSIGNED JOB RELEASE         14 FREIGHT POOL MAINT       24 EMPLOYEE MASTER
05 YARD OVERTIME & CLAIMS       15 NOT USED                 25 SHIFT REPORT
06 ASSIGNED JOB MAINT           16 NOT USED                 26 CORRECT DATE/TIME
07 NOT USED                     17 DEADHEAD TRAIN SERV      27 EXTRABOARD AUGMENT
08 SWITCHMEN FILL LIST          18 RELEASE DEADHEAD SERV    28 DAILY BUMP BOARD
                                                            99 CREW DISP INFO MEMO

PF1=TURNOVER        PF2=INQUIRY MENU          PF3=EXIT      PF10=OUTBOUND CALL SHEET
```

Figure 2.6-7: CCATS Main Menu.

```
CDB0300  E  BA              CALL TRAIN CREWS          08/09/90 16:00:17 BA98505
 TARGET-DIST:     MENU-SEL:                        MOUNTAIN P - BAKERSFIELD
   TRAIN-SYMBOL: 1BRLAF  01                              POOL: MT      HOME/AWAY: H
                         ENG-CREW ODT: 080990       1600
                         TRAIN-CREW-ODT: 080990     1600
SPRINT-TRAIN?:           TERM DEPARTING:                  DESTINED:            DHEAD?
FUNC   CC  NAME                  LO          SSA         NORM-ASGN            TURN
       EN  PE MCGUFFIN           AO        565589785     RMTT131EN            MT131
           (619) 245-4136         2 HOUR CALL IN WINTER... PAGER 916 551 5221

       FI  JW CASH               AO        459138219     EXB 017EN            MT106
           (805) 324-9289 NEEDS PILOT ON EVERYTHING.----PAGER AREA CODE
           Y
       CO  JF HARDIN             AO        557800008     RMTT101CO            MT101
           (805) 871-2370
       B1  AW LUCERO             AO        572420279     RMTT101B1            MT101
           (805) 395-1819

       B2  TEMP BLANK                      999999996                          MT101


  1       1     CREW-UNIT: CO-2BK     ENG-FI MARRIED?: N  GENERATE CALLSLIP?:
  FUNCTIONS: CALL, FILL, LAYO, REJT, TOP, RJSU, RJNR, RJNW, RJNA, MANU, VACT
  I1200  ENG AND TRN-CREW GIVEN SAME ON-DUTY DTE/TME - IF INCORRECT, REENTER
  PF1=POOL-COUNT  PF2=POOL-SELECTION  PF3=MENU  PF9=MENU-SEL  PF11=CLEAR NTRY
```

Figure 2.6-8: Screen for Calling a Pool Crew.

In the first quarter of 1991, train dispatcher "site" data will be maintained on a current basis in TOPS/TCC. A link from TOPS/TCC to CCATS will convert information into crew districts in CCATS, providing lineup information automatically and changing call status on various CCATS terminal displays. The need for manual lineup updates every four hours will be eliminated.

In the second quarter of 1991, a computer-to-computer voice link will be made between CCATS and DVX allowing the current data in CCATS, e.g., individual board standing and current lineups by applicable crew district(s), to be available to crew members in voice form. Crew members will be able to phone in and receive current data without the necessity for crew-dispatcher contact.

2.7 Union Pacific

In the past year the Union Pacific has consolidated dispatching and crew management at the Harriman Dispatching Center in Omaha. All lines are represented on video projection screens like those shown in Figure 2.7-1 in the "Bunker," a four-foot-thick-concrete-walled, tornado-proof enclosure for the three dozen dispatchers and supervisors. Directly above them are the crew callers, time keepers and other crew-management support services. (See Figure 2.7-2.)

UP requires slightly more than 2,000 crews, of all types, per day, drawn from its 13,000 engineers and trainmen.

Like most other large roads, UP operates with a large number of different labor agreements affecting its various territories and districts. Details of many of these have never been written down. Crew callers are expected to learn all these details. Hence the period of on-the-job training is lengthy and a caller who is competent in one district may not handle a different district very well without a year or more of experience. Several staff members are working at incorporating all of the pertinent details of the many agreements into the crew-calling software, but this task will take several years to complete.

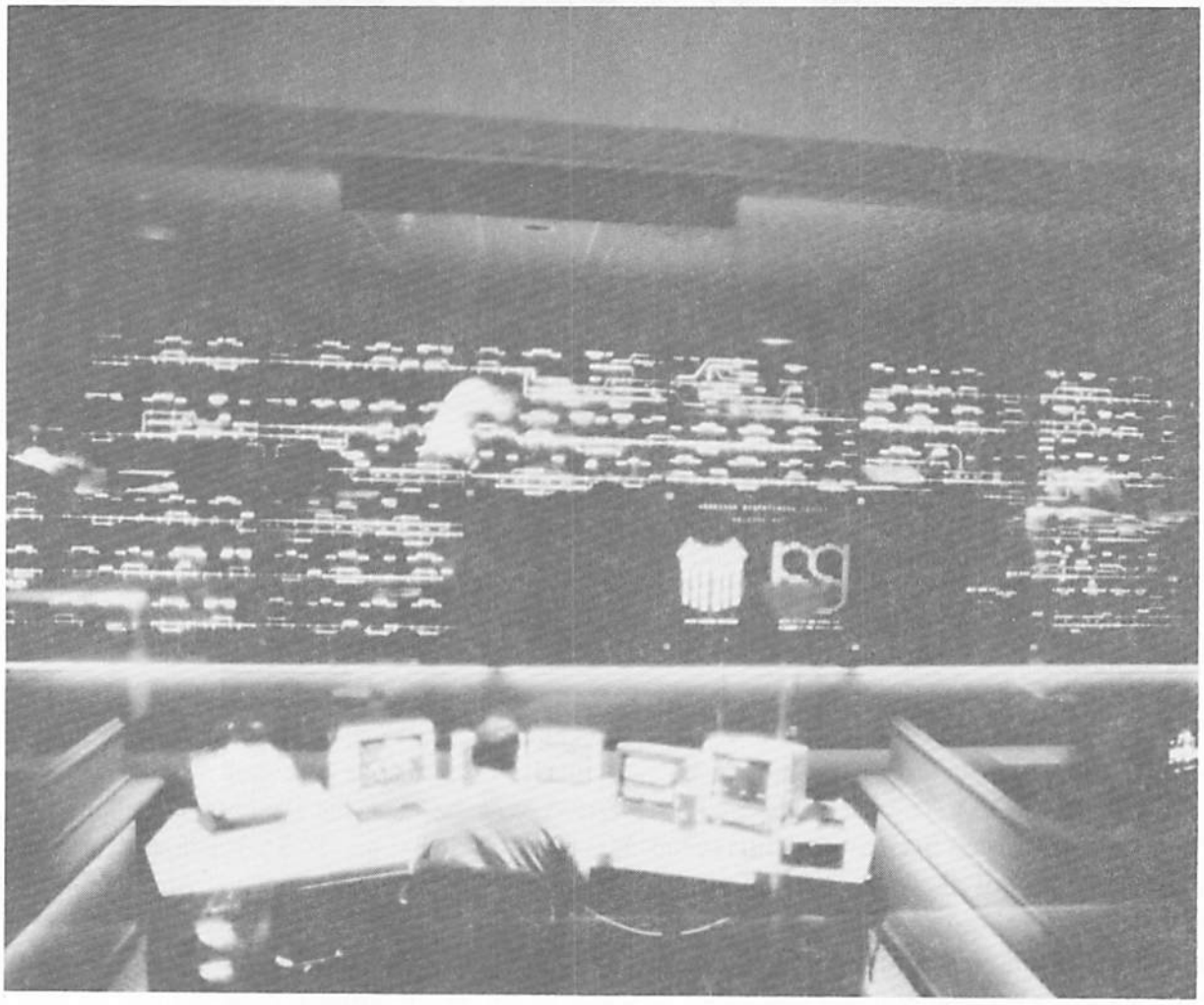


Figure 2.7-1: View of a Small Portion of UP Operations Control Room Showing Video Screens.

Figure 2.7-2: Crew Callers, Time Keepers and Related Staff for the Entire Union Pacific Railroad.

Train Scheduling

Dispatching at the UP is controlled by a master program called TCS (Transportation Control System), which facilitates real-time information flows among all participants in decisions affecting dispatching and crew calling. (See Figure 2.7-3.) The nominal schedule, referred to as the "Service Design," is established by the marketing staff and adjusted from time to time as business conditions change. TCS takes inputs from and feeds information back to all of the following: (1) the CAD system (Computer Aided Dispatching), (2) the MYOs (Managers of Yard Operations), (3) the MTOs (Managers of Train Operations), (4) the corridor managers, (5) the locomotive distribution coordinators, (6) the crew callers, and (7) crew balancers. There are hundreds of information screens available within TCS. Those available at any given terminal depend upon its geographic location and the responsibilities of its user. Figures 2.7-4 and 2.7-5 are examples of screens of train movements and locomotive distribution respectively.

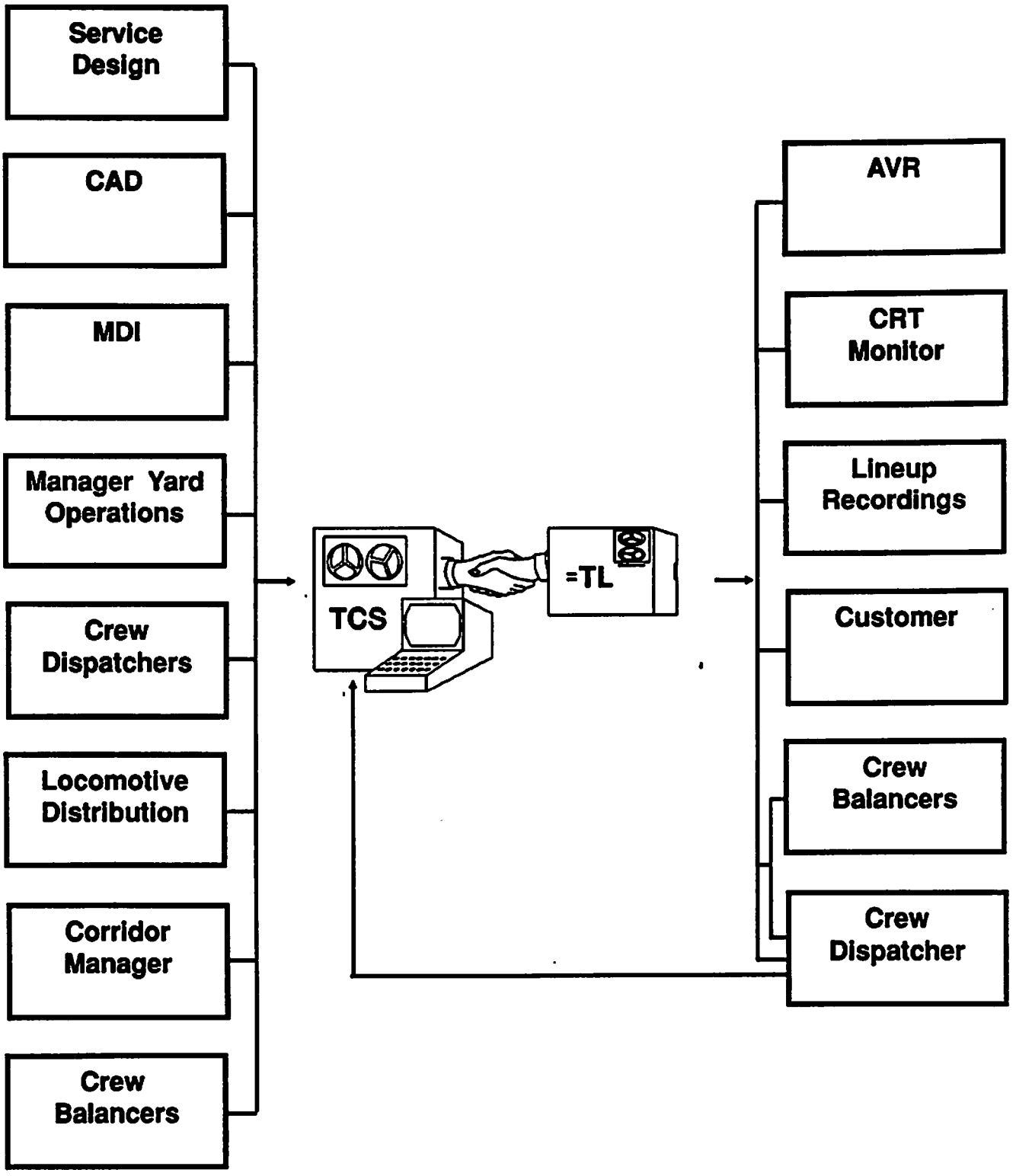


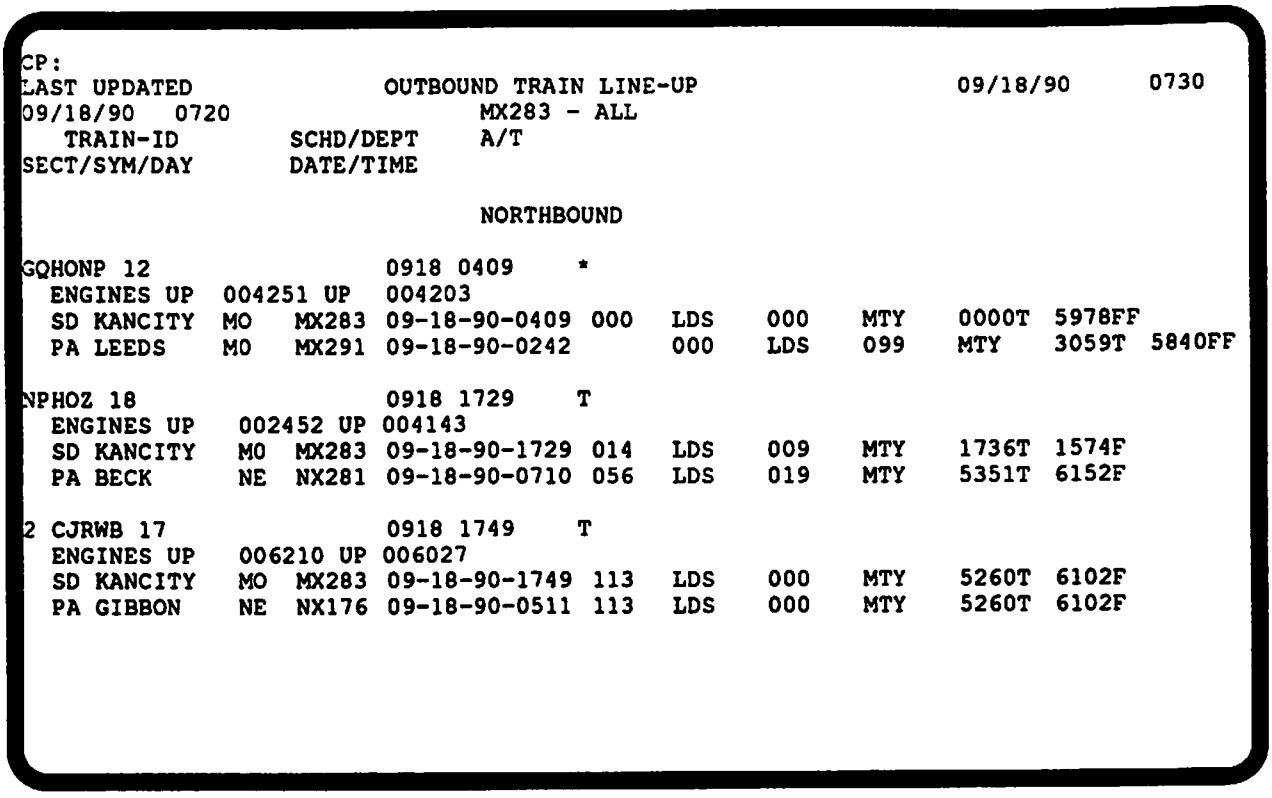
Figure 2.7-3: Union Pacific's Transportation Control System.

```
                        SCHEDULED TRAIN SUMMARY--LAST 2 EVENTS
TRAIN/JOB  NOFW    16                    ORIG STA      AVONDALE LA      C  806

CATEGORY - V-PRIMARY MANIFEST            TYPE - THRU
CONDUCTOR I PLUNKETT                  ENGINEER F DELOACH

                                    DWPCCAAS SCHED    PROJ  P  VAR  REQ  GS  REQRD
***LINK ORIGIN*** ***LINK DEST*** BLSSRTXT TONS     TONS  M  %%%  HTT  GD  H-PWR
AVONDALE LA C 806 ALEXANDR LA C625  .....  12843    5918  A  020  1.0  A3   5918
ALEXANDR LA C 625 FTWORTH  TX TP250 ..... 14269    8182  A  011  1.0  A3   8182

    ST LOCOMOTIVE  ACTL   COMP          PICKUP SETOUT RECV   *NEXT ASSIGNMENT DWPCEAAS
    CD INIT NUMBER HPWR   HPWR   DIR     CIRC-7 CIRC-7 ROAD ****OR NOTES****  BLSSTTXT
X      UP  003370  3000   3000   F       C 806                FWSH   18       YY.YY.63
X      UP  003134  3000   3000   B       C 806                FWSH   18       YY.Y..63

TOTALS:            6000   6000   HP/TTON: (SCHED TONS) = 0.5 (PROJ TONS) = 1.0
      ------------------------------------------------------------------

CABOOSE ID- NONE REPORTED
FRONT TRAIN UNITS: UPF 019384 WK       END TRAIN UNITS: UPR 008211 WK
CUR STATS NOT AVAILABLE
EVENT  CITY/ST     STA/YD MO-DA-YR-TIME TIM DIF      LOADS  MTYS   GR-TONS      LENGTH
CT     AVONDALE    LA     C      806    11-16-90-1600
      ------------------------------------------------------------------
SH  STATS  81LDS  66MTYS  10386TONS  8918FT
SP  AVONDALE  LA C 806                          81     66     10386     8782
SD  AVONDALE  LA C 806    11-16-90-1700         81     66     10386     8918
```

Figure 2.7-4: Progress of Train NOFW on November 16,1990.

```
                              ALL POWER AT STLOUIS MO (DRN)              PAGE 001
                                 IN THE NEXT 016 HOURS
                                11/16 15:43 (CENTRAL TIME)

          S          DWPCEAAS  *WORK DUE*  ************INBOUND/OUTBOUND************
***UNIT*** V   HPWR   BLSSTTXT   MODY MAINT EV V ST D *TRAIN ID* CIRC7 MODY HRMN AGE
    ------------------------------------------------------------------------------

*** ONHAND ***
UP   118   F    2250  ......43  .... SI ..  TA       LKJ56   15  MX001 1115 2100 - 18
                                               PJ       LKJ55   18  MX001 1118 0900
UP   159   F    2250  ......43  1112 LU TS  TA       LSV52   18  MX001 1109 0215 - 181
UP  3128   F    3000  YY.Y..63  .... .. ..  TA       NLAS    15  C 009 1116 0720 -   8
                                               PJ       ESLSL   16  C 009 1116 1200
UP  3354   F    3000  YY.YY.63  .... .. ..  TA       NPASCX  15  C 009 1116 1325 -   2
                                               PJ V     ASNL    16  C 009 1116 1900


                                        ***SUMMARY***
                                 ****TOTAL****
                                 UNITS  HPWR
                                 -----  ----
      SWITCH/HELPER              0      0
      ONHAND                     12     35250
      INBOUND-TERM               0      0
      INBOUND-THRU               0      0
      SHOP RELEASES              0      0
```

Figure 2.7-5: Power Available at St. Louis, MO on November 16, 1990.



```
CP:
LAST UPDATED              OUTBOUND TRAIN LINE-UP                  09/18/90      0730
09/18/90   0720                  MX283 - ALL
   TRAIN-ID        SCHD/DEPT     A/T
SECT/SYM/DAY       DATE/TIME

                                 NORTHBOUND

GQHONP 12                  0918 0409     *
  ENGINES UP  004251 UP    004203
  SD KANCITY  MO   MX283 09-18-90-0409 000   LDS    000    MTY    0000T  5978FF
  PA LEEDS    MO   MX291 09-18-90-0242       000    LDS    099    MTY    3059T  5840FF

NPHOZ 18                   0918 1729     T
  ENGINES UP   002452 UP 004143
  SD KANCITY   MO  MX283 09-18-90-1729 014   LDS    009    MTY    1736T  1574F
  PA BECK      NE  NX281 09-18-90-0710 056   LDS    019    MTY    5351T  6152F

2 CJRWB 17                 0918 1749     T
  ENGINES UP   006210 UP 006027
  SD KANCITY   MO  MX283 09-18-90-1749 113   LDS    000    MTY    5260T  6102F
  PA GIBBON    NE  NX176 09-18-90-0511 113   LDS    000    MTY    5260T  6102F
```

Figure 2.7-6: Example of an Outbound Train Lineup at Station Designated MX283.

TCS data regarding train movements is combined with outputs from the CAD system in another program called "=TL," which generates the train lineups. Figure 2.7-6 shows a typical example of an "=TL" screen.

Crew-Calling

Based on the train lineups and standings presented to them by TCS and =TL, callers match up crews with estimated train departure times. Figure 2.7-7 shows a partial list of standings for Cheyenne-Rawlins. By moving a cursor to a name on the list, a caller can summon a screen of information about a particular employee like that shown in Figure 2.7-8. Among other things this screen shows the employee's home telephone number(s), beeper number and motel(s) where the employee usually takes rest. Provision is also made for several other numbers, including temporary ones phoned in by the employee. Dialing any of these numbers can be accomplished by placing a cursor on the number and touching a key.

The system generates a record which is transmitted to the timekeepers showing the time for which an employee was called. These are currently being matched with the time slips submitted by employees at the conclusion of each job, but UP intends to automate this process in the next few years.

```
WORKING    TRM ROTATING CHEYENNE-RAWLINS THRU FRT    10/30/90 14:31C
       WX510       RA05   00099  75301  75401  76301  76401
*
***T521    AVAILABLE 001
       CON P       OK     HA WILLIAMS          $
       BR1 P       OK     DM CLASON            $      M/U:10/29 1510M
                                DUE 1WKS VACATION 11/23
F      BR2 P       LP     RM SIMON             $      L/O:10/30 1114M
                                                      LTUT:10/28 2220M

*
***T638    AVAILABLE 002
       CON P       EV     LC CROZIER           $      L/O:10/28 2300M
                                                      LV:10/01 0001M LTUT:09/30 2350M
                   OK T    DP     MURRY         $      WX510 XC05
                                DUE 1WKS VACATION 11/23
F      BR1 P       EP     GS SCHLUND           $      L/O:10/29 0000M
                                                      PL:10/27 1320M LTUT:10/26 1115M
CF     BR2 P       OK     JW RAINWATER         $      M/U:10/30 1036M
```

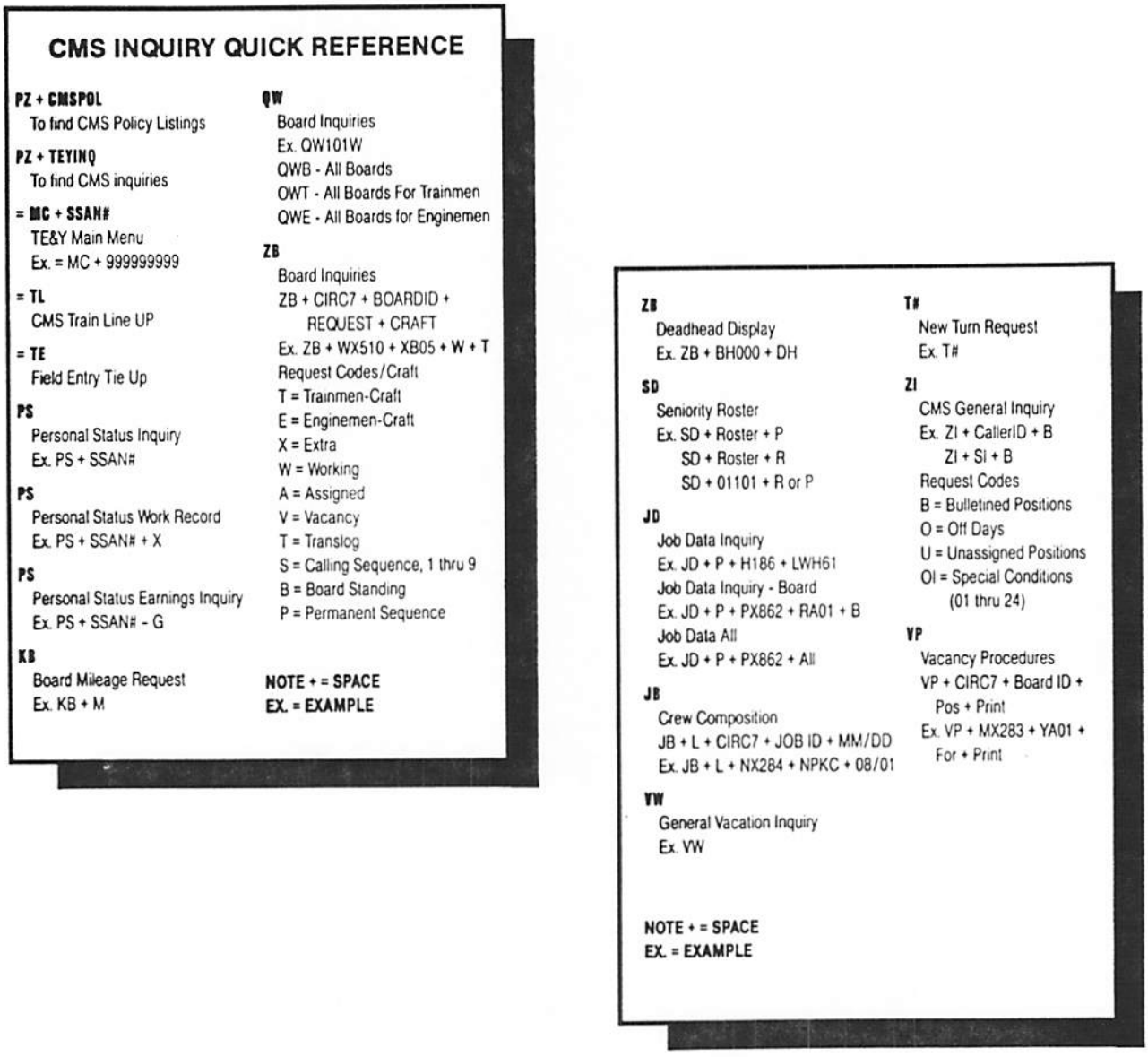
Figure 2.7-7: Partial Listing of Standings on 10/30/90 for the Cheyenne Rawlins Thrufreight Pool.

```
                          ** TELEPHONE NUMBERS **    LAST REV - 11/13/90 13:40 C
BL BOYLES          346-38-0070          CRAFT- T
ASSIGNMENT LOC- ZC252    CURRENT STATUS- OK  REG ASSIGN- ZC252  AA40 SC51 CON P
MESSAGE-UTU(CTE)L/C IL DIV.NEEDS CALL SG15

           TELEPHONE NUMBER      DIS B/R/V/D          EFFECTIVE   TIME  RANGE
           AREA  PREFIX NUMBER   IND    IND         MMDDYY HHMM      MMDDYY HHMM
TEMPORARY-     -     -                          ====> FROM          TO            C

      HOME 1-      618 - 548 - 4784    Y
      HOME 2-      618 - 548 - 4875    Y
      HOME 3-        -     -

                                                                AFHT LOCATION
      AFHT 1-      501 - 236 - 7641    Y      ========>            C 243
      AFHT 2-      217 - 253 - 5488    Y      ========>            ZB145
      AFHT 3-      314 - 785 - 7100    N      ========>            X 166
      AFHT 4-        -     -                  ========>
      AFHT 5-        -     -                  ========>
      AFHT 6-        -     -                  ========>
```

Figure 2.7-8: Example of a Screen Showing Telephone Numbers for an Employee.

Information Available to Employees

Information from the =TL system and the standings data are available to employees through several media. The newest of these is the AVR (automated voice response) system installed in February, 1990. Real-time data are also available at computer terminals installed at all crew-change stations and through dial-up modems to personal computers. The PC software required to gain access through phone lines has been distributed only to local chairmen at this writing. Figure 2.7-9 shows the menu of information available. Finally, the usual tape recorded messages are still available and still widely used with about 10,000 calls per day.



CMS INQUIRY QUICK REFERENCE

PZ + CMSPOL
To find CMS Policy Listings

PZ + TEYINQ
To find CMS inquiries

= MC + SSAN#
TE&Y Main Menu
Ex. = MC + 999999999

= TL
CMS Train Line UP

= TE
Field Entry Tie Up

PS
Personal Status Inquiry
Ex. PS + SSAN#

PS
Personal Status Work Record
Ex. PS + SSAN# + X

PS
Personal Status Earnings Inquiry
Ex. PS + SSAN# - G

KB
Board Mileage Request
Ex. KB + M

QW
Board Inquiries
Ex. QW101W
QWB - All Boards
QWT - All Boards For Trainmen
QWE - All Boards for Enginemen

ZB
Board Inquiries
ZB + CIRC7 + BOARDID +
REQUEST + CRAFT
Ex. ZB + WX510 + XB05 + W + T
Request Codes/Craft
T = Trainmen-Craft
E = Enginemen-Craft
X = Extra
W = Working
A = Assigned
V = Vacancy
T = Translog
S = Calling Sequence, 1 thru 9
B = Board Standing
P = Permanent Sequence

NOTE + = SPACE
EX. = EXAMPLE

ZB
Deadhead Display
Ex. ZB + BH000 + DH

SD
Seniority Roster
Ex. SD + Roster + P
SD + Roster + R
SD + 01101 + R or P

JD
Job Data Inquiry
Ex. JD + P + H186 + LWH61
Job Data Inquiry - Board
Ex. JD + P + PX862 + RA01 + B
Job Data All
Ex. JD + P + PX862 + All

JB
Crew Composition
JB + L + CIRC7 + JOB ID + MM/DD
Ex. JB + L + NX284 + NPKC + 08/01

VW
General Vacation Inquiry
Ex. VW

NOTE + = SPACE
EX. = EXAMPLE

T#
New Turn Request
Ex. T#

ZI
CMS General Inquiry
Ex. ZI + CallerID + B
ZI + SI + B
Request Codes
B = Bulletined Positions
O = Off Days
U = Unassigned Positions
OI = Special Conditions
(01 thru 24)

VP
Vacancy Procedures
VP + CIRC7 + Board ID +
Pos + Print
Ex. VP + MX283 + YA01 +
For + Print

Figure 2.7-9: Example Menu of Types of Information Available on Personal Computers.

3.0 Sources Of Stress And Fatigue In Current Practices

This discussion of the sources of stress and fatigue is based almost entirely on the remarks of two dozen working engineers made during the three focus group sessions described in Section 1.3.2. This summary of the sessions was circulated to the BLE local and general chairmen who organized the sessions for their review and reflects any corrections made by them.

At the start of each focus-group session, there was a general discussion of the significance of stress and fatigue in the lives of engineers. In every group, fatigue was felt to be a major problem, at least as much of a threat to safety as substance abuse. Efforts by management, unions and government to curtail substance abuse were viewed as having been largely successful; comparable efforts to mitigate fatigue and stress are sought.

Numerous incidents or near accidents were described in which an engineer had dozed off. They noted that many of these incidents went unnoticed and that a large proportion of those that were noted by management were dealt with through informal disciplinary practices, which generated no records. Thus they felt statistical analysis of accident and incident records could not give a meaningful picture of the significance of fatigue.

3.1 Uncertainty as to Time of Call

In two of the three groups, unpredictable working hours were identified as the most important single cause of stress and fatigue, although several other significant causes were also present, as described below. (In one group, which was based at an unusually busy terminal, the sheer number of working hours was the primary cause, as discussed in 3.2.)

Everyone of the engineers agreed that there was too much uncertainty about when he would be called to report for work. Because of it, all commitments to family and friends were tentative and subject to frequent disruption, which contributes to a considerable amount of stress and discord within many families.

Many participants noted that sleep was often taken at times and in amounts which were inappropriate to the hours on duty which followed. If an engineer tried to sleep every day that there was a possibility he would be called to work that night, he would hardly ever be able to participate in family activities. Hence there was a tendency to go ahead with normal daytime activities and take the risk of having to work without being properly rested, whereas if there were reasonable certainty about when jobs would start, most engineers would be willing to give up or reschedule the other activities. There were also many instances cited in which jobs were not called until long past the time originally estimated, which resulted in situations in which the engineer was ready to sleep again when the call finally came. In short, there was general agreement that the more certainty as to when the next job will be called, the more likely an engineer is to be appropriately rested.

Closely related to uncertainty about the timing of jobs was the sense of lack of control over one's life. At one of the railroads, management strongly discouraged marking off for personal reasons, so much so that was hardly ever done. Instead, men who wanted time off were forced to lie by calling in sick, to let the telephone go unanswered or to verbally abuse the callers. Men whose personal ethics prevented their using these tactics ended up working even more because of the time off won by the liars and cheats. The other two roads generally allowed marking off for one or two or three days without penalty.

The causes of uncertainty about time of call were numerous and varied substantially among the three railroads. At the first focus group, there was a perception (later confirmed by management) that the railroad's train scheduling system is sufficiently advanced that it could provide eight hours advance notice of jobs about 90% of the time. However, in practice the engineers report that they are unable to get the information they want for the following reasons:

(1) The usefulness of the information available from the crew callers is highly variable. Some callers are almost always helpful and provide all of the information at their disposal. Other callers are habitually prone to withhold information and are often downright rude. Sometimes the callers are so busy that they really do not have time to provide complete information.

Callers sometimes withhold information deliberately even when they have time to talk because they know that crew members would prefer to avoid certain jobs and that if crewmen can estimate when those jobs will be called, they will not answer the phone during that period in hopes of getting the next (and better) job instead.

(2) Although information on standing is available from a computerized voice-response system, it is apparently not updated automatically in real time. Furthermore, information on train lineup is not included, hence the system is not very useful for estimating when one's next job will be called.

(3) Crew members have not been given copies of the codes that would permit them to check on train lineups from the computer terminals accessible to them.

(4) As a result of the shortcomings of the other means of getting information, crewmen frequently resort to calling Yardmasters and Trainmasters to find out when trains are likely to ready for departure. Management attempts to discourage this practice but it goes on anyway.

(5) Although the railroad's computerized system was designed to provide access from personal computers via dial-up phone lines, this option has never been implemented. The rationale for this decision was unknown.

The engineers in the second focus group worked on districts in which train dispatching was only partially computerized and crew management was still predominantly manual. Information about train locations and lineups was often simply unavailable to crew callers on a timely basis. Contributing further to their uncertainty they described the following:

(1) Even when accurate information regarding train lineups and crew standings was available to crew callers, some of them failed to make it available to engineers. The reasons for their failure ranged from being too busy, to incompetence, to personal hostility toward a particular engineer calling.

(2) Standings were frequently readjusted to satisfy various objectives of management and/or of labor agreements. Examples of reasons for these changes include minimizing away-from-home lodging costs, minimizing deadheading costs, and meeting mileage quotas of different districts supplying crews

to an inter-divisional pool. The timing of the changes in the pool operation and the standings of individual engineers was unpredictable.

(3) Informal, verbal agreements between callers and local chairmen can further alter the standings of individual engineers in ways that are both unpredictable and unreported to involved persons.

(4) Trains, except for intermodal or other high-priority traffic, were often delayed until an away-from-home crew was rested in order to minimize costs. This practice changes both lineups and standings and creates additional uncertainty.

(5) Clerks were often derelict in updating recorded announcements of standings information because of other demands on their time. Examples were described in which announcements were more than 24 hours old.

(6) Reaching either a crew caller or a recorded announcement was sometimes difficult. Busy signals and unanswered phones were a common occurrence.

(7) Those engineers who worked to a distant terminal which had computerized standings available reported that the service was as yet of little value since train lineups, deadheading lists and other pertinent items were not usually included.

At the third session, computerized dispatching and crew-calling systems had recently been installed, but the engineers said that the accuracy of estimates of train departures was still poor for the following reasons:

(1) The dispatching system does not yet have all the necessary automated communications links in place. Thus the dispatchers are often working with information several hours old.

(2) Complaints about dispatching errors were common. Numerous cases of being stopped or held in a siding for an hour for no apparent reason were reported. Meets were often poorly coordinated i.e., one train was put in a siding much earlier than necessary or desirable for efficient operation. These errors caused delays and introduced additional uncertainty into the schedule.

(3) Certain dispatchers were reported to delay trains for no legitimate reason, but rather to punish engineers who had incurred their displeasure. Management was described as unable to fire these dispatchers because it was so difficult to attract anybody to fill the positions.

(4) Locomotive reliability is poor. The probability that one or more units in a consist will fail on a given trip is estimated at 50%. Although it is usually possible to reach the destination, arrival will be delayed significantly. Poor reliability results from an inadequate maintenance program coupled with tendency on the part of middle managers to defer expenditures for replacement parts and equipment. Instances of denial of equipment problems on the part of various managers were cited by several participants. Failures by round-house crews to fill fuel tanks and sand boxes were also a problem.

(5) Many of the run lengths were chosen by management to require eight hours or more even with everything operating normally. There is not much leeway to account for the minor delays and/or extra work (doubling a hill, pickups and setouts, etc.) that occur most of the time. The result is that long-pool crews frequently "die" under the Hours of Service Act. They are compelled to tie up and wait for transportation to their destination terminal, which adds further delay and uncertainty. Participants reported numerous instances in which 15 or 16 hours had elapsed from the time they reported for duty until they reached their destination terminal or place of rest.

Dealing with all of these problems is a major challenge for the railroads. Engineers suggest the following goals:

(1) Operating most trains on predictable schedules. Substantial investments in locomotives and track, improvements at bottlenecks, etc. may be required in some situations.

(2) Dispatching systems must be upgraded and linked to other railroads and major customers to provide reasonably accurate estimates of train arrivals and departures.

(3) An adequate information system for operating employees should show train lineups in each direction, standings (with each employee's name listed along with his rest status and any other pertinent information, such as intended deadheads), and an estimate of when the calling employee will next go to work.

(4) The information should be updated in real time.

(5) Access to the information should be available through a variety of means including automated voice response, talking to the callers, remote terminals and home computers. Each medium should have sufficient capacity that busy signals and unanswered lines are rare.

(6) Crews should be called eight to ten hours in advance, with a tolerance of one or two hours. (There was great doubt that any such performance would ever be achieved unless there were a significant penalty payment for non-compliance incorporated in labor agreements.)

3.2 Total Hours of Work

At the first focus group, it was agreed that the most important cause of fatigue and stress was simply the total number of hours of work that had to be done. An upsurge in business, several retirements and some transfers to Amtrak had left the pool significantly undersized. The inherent delay in recruiting and training replacement engineers had led to a situation in which engineers were required to work 21 days straight in order to get one day off, which was expected to persist for another few months. Although these engineers also identified a number of changes in scheduling, information availability, etc (discussed below) which could help mitigate stress and fatigue, none of these were as important as simply reducing the work week to 40 to 50 hours, at least for those men who wanted the reduction.

In this group, there was an extended discussion of the issue of who gets which job. Like almost all road engineers on U.S. railroads, their earnings were based on the number of miles worked in a given pay period. However the number of hours required to cover a given number of miles varies greatly among different runs in their district. For example, some 300-mile runs can almost always be completed in six hours, while some 150-mile trips usually take more than 10 hours. Furthermore, some jobs generally offer a quick return trip, while others usually entail a two-day absence from home. Hence, the present compensation system creates a strong incentive to try to avoid undesirable jobs and to work as much as possible on those that bring maximum pay for minimum hours. This leads to "call dodging" (taking the phone off the hook or letting it go unanswered at the time an unwanted job is expected to be called) and "sharp shooting" (other manipulative practices intended to secure desirable jobs and/or avoid unwanted ones). The result is a situation that provokes cheating and conflict, especially when a terminal is very busy and many employees are working more than they desire.

The group estimated that a majority (about 60%) of the local membership actually preferred the heavy workload because it allowed them to earn up to about $1800 a week. However, a substantial minority felt that the fatigue and disruption of relationships with their families were not worth the extra money they were earning. They noted that their colleagues who had transferred to Amtrak had given up ten to fifteen thousand dollars a year in earnings for a regular five-day-week job, but were happy with the change. Several members aspired to

certain assigned jobs that would guarantee them shorter, regular hours but lower income, but figured they would have to wait for years because of the small number of such positions.

In the other two focus groups, members expressed general satisfaction with the amount of work, which generally averaged eight to ten round trips per month or 40 to 50 working hours per week (70 to 75 hours per week away from home). No one voiced strong objection to the number of hours or miles worked. Every man who commented said that the trend toward more inter-divisional runs had tended to reduce hours worked, thus improving the quality of his life by allowing him more time with his family.

Goals for changes in this area include:

(1) Maintaining pool sizes sufficient to insure that no one is compelled to work excessive hours. This goal is generally met, but better planning to anticipate problems and greater flexibility in converting trainmen to engineers are needed.

(2) The trend toward longer pools is helpful and should continue.

(3) Limitations on maximum number of hours worked per month in combination with a fixed base salary were regarded as desirable.

(4) Penalty payments are needed to insure that "dead" crews are not left waiting hours for transportation to their destinations or places of rest.

3.3 Waiting and Commuting Time

Several engineers complained that long commutes are another major contributor to fatigue, because of all of the consolidations and reductions in employment that have taken place in recent years. Some train crew members are now working out of terminals more than a hundred miles from their homes. A few were mentioned in the focus groups who live more than two hundred miles from their terminals, and one lives about six hundred miles away. Most of these long-distance commuters were trainmen, not engineers.

Such employees frequently arrive at work ready to sleep even though they have had eight or ten hours off duty. They spent a good deal of their time on the job sleeping, except when switching or other activities required their participation. Over a period of years, these problems should be reduced as employees relocate, but there was general apprehension that future mergers and reorganizations could create new disruptions.

3.4 Equipment Problems

At one of the focus groups, inadequate maintenance of locomotives was cited as a major contributor to fatigue not only because of its impact on schedule reliability, but also because the equipment failures directly caused increased work load and physical discomfort. These engineers said they frequently had to work with bad-order equipment on locomotives, including dynamic brakes, speedometers, telemetry devices and counters. The most common defect was the lack of a working wheel-revolution counter (needed to tell when the rear end of the train has cleared a specific point, as when stopping on a siding) resulting from the input connection never having been installed. Engineers were particularly outraged that they would be held to blame for an accident caused by this faulty equipment even when they had filed bad-order reports. They noted that some managers were ignoring these reports in order to stay within their budgets.

A second major source of fatigue for the engineers in this group was the extremely hot weather characteristic of the districts in which they worked. Although their labor agreements required that all locomotives be equipped with air conditioners, they were not kept in good repair. Participants estimated that only 10 to 20 % of their

runs were made with a working air conditioner in the lead cab. As a result they often worked in temperatures above 100 degrees for many hours and suffered great fatigue as a result.

Some of the inoperative coolers were thought to be the result of sabotage by round-house crews. Labor agreements require that if one unit in a consist has a working air-conditioner, that unit must be placed on the point by the hostlers. However shuffling the consist order and/or turning units on the "wye" can easily take 30 to 60 minutes. Hostlers find it much quicker to disconnect a wire or pull a fuse so that no units have a working A/C and they can avoid reordering the consist. By agreement, engineers can put the unit with the working A/C on the point, but doing so delays the train and incurs the displeasure of the dispatcher, who may punish the engineer later.

In each of the focus groups there were complaints about a variety of less-common equipment problems which can contribute to increased workload and fatigue. These included: speed restrictions related to special cars; glare from rain and snow reflecting from high-mounted headlights on some locomotives and new equipment installed on engines without providing adequate instruction and/or simulator training. One incident was described in which a crew was ordered by a supervisor to take a train which was unsafely built. There was anger about managers' lack of concern for safety in such situations.

As goals for improvements in these areas, the engineers suggested that:

(1) Locomotives should be maintained or replaced to bring power reliability up to 98 or 99%. In particular, air-conditioner maintenance should be mandatory in hot climates.

(2) Stronger regulations and/or agreements are needed to make certain that engineers are not compelled to operate trains with defective equipment or which are poorly built. Rights of refusal comparable to an airline pilot's were sought.

3.5 Inadequate Sleep at Away-from-Home Terminals

There was also general dissatisfaction expressed because of inability to get sufficient rest at the away-from-home terminal. Eight hours off duty seldom translates into more than four hours sleep because of the time required to get to a motel and eat, coupled with the fact that sleep will be interrupted by a telephone call two hours before the next job starts.

In two of the groups, the rest facilities provided by the railroad were roundly criticized for their unsuitability as places to sleep. Some were temporary buildings ("modules") located at yards. In these noisy locations, their thin walls and inadequate air-conditioners resulted in very poor quality sleep. Frequent instances of being awakened by the staff were recounted, which were the result of the staff having failed to keep track of which person was in which room.

Sleep quality was often degraded at away-from-home terminals by noise and other unpleasant environmental conditions in the motels contracted by the railroads. Rooms adjacent to pools or parties were a common complaint. Failures on the part of motel managers to inform house keeping staff that railroaders were trying to sleep in the daytime were another.

Attempts to sleep out of synchronization with ones circadian rhythm were also a frequent cause of poor-quality sleep.

Suggested improvements in this area were:

(1) Crews should always be allowed the option of claiming ten or twelve hours rest whenever they feel they need it. At present some railroads permit these requests for some employees, but the practice should be universal.

(2) Management should pay increased attention to the motels contracted to provide away-from-home rest. These motels should be required to provide blocks of rooms for railroaders away from pools and function rooms. Housekeeping services should be timed to avoid interfering with sleep. In some instances, the motel is grossly unsatisfactory (filthy, located near an airport runway or rail yard, etc.) and the contract should be awarded to another hotelier. Long-term contracts should be avoided so that the railroad can maintain some leverage to force motel managers to attend to the special needs of train crew members.

(3) Trailers and temporary buildings in yards or other noisy locations should be eliminated.

3.6 Conflicts within the Locomotive Crew

All of the engineers complained to some extent about how little help they receive from their fellow crew members. In one group, most said they hardly ever got any relief. Numerous examples were cited of conductors and brakemen who slept for hours and refused to help the engineer in any way.

Some engineers strongly favored converting conductors and brakemen to co-engineers with the expectation that as such they would drive the train for a substantial portion of each trip and actively assist the engineer in dealing with various other tasks.

3.7 Conflicts with Dispatchers

There were complaints about errors made by dispatchers in each focus group, but they were reported to be much more frequent in one group. This group's railroad had recently reorganized dispatching functions in a way that left many persons assigned to a center when they would rather be somewhere else. Dispatchers are reported to be experiencing an unusually high level of stress, as evidenced by fist fights and domestic violence among the staff. This situation, coupled with the dispatchers' dissatisfaction about receiving only about half as much income as the engineers, has resulted in numerous instances in which dispatchers deliberately delayed trains simply to punish the engineers. Numerous cases of being stopped or held in a siding for an hour for no apparent reason were reported. Meets were often poorly coordinated i.e., one train was put in a siding much earlier than necessary or desirable for efficient operation. These errors caused delays and introduced additional uncertainty into the schedule.

In this group, certain dispatchers were reported to delay trains for no legitimate reason, but rather to punish engineers who had incurred their displeasure. Management was described as unable to fire these dispatchers because it was so difficult to attract anybody to fill the positions.

Difficulty in reaching dispatchers by radio was reported by most of the engineers in all of the groups. In these situations they felt anxious because they could not find out what was going on. Some of these difficulties were due to equipment faults or poor-reception conditions, but some were known to have resulted from dispatchers turning down the volume on their radios so that they could do other work without being disturbed by engineers.

Excessively complicated rule books were cited as another source of conflict with dispatchers. In some cases, they were described as masses of amendments and appendices that make them virtually incomprehensible. Instances were cited in which neither engineers nor officers could figure out what the rule book required.

Several engineers mentioned that they frequently encounter situations in which they are told they will be held on a siding for a considerable period of time, sometimes as much as a few hours. Crews feel they should be allowed to rest or sleep in these situations. This is in fact common practice on some railroads and some dispatchers accept it and simply call the crews on the radio when the time comes to move. It is however a violation of company rules. Occasionally, crews are subjected to discipline. The rule is perceived as counter-productive to safety because napping is probably the best use of a crewman's time in this situation.

Elimination of all conflicts between engineers and dispatchers is probably impossible, but engineers suggest that a substantial improvement could be achieved by:

(1) Making the rules comprehensible. Rule books should be loose-leaf, with changes made through page replacement rather than references to appendices and supplements. Computer displays in locomotive cabs showing dispatching information as well as rules would be valuable, but only if an adequate maintenance program were established for them.

(2) The numerous errors being made by dispatchers should be eliminated through better training of dispatchers and the improvement of software in computer-aided dispatching systems.

(3) Some of the improper orders given engineers appear to be the result of personal vindictiveness on the part of the dispatcher. Retraining or replacement of incompetent or unsuitable employees and/or system redesign will be needed to deal with the issue.

3.8 Conflicts with Crew Callers

Conversations with crew callers were often the focal point for a variety of conflicts between the engineers and the rest of the railroad. Engineers want control over their lives; the rest of the railroad wants them to work whenever needed. The caller is the intermediary for these demands and is under pressure to fill the job, not make the engineer happy. In situations in which engineers are being forced to work more than they want to, lying about being sick is often the only way to get a day off. This creates further distrust and conflict between callers and crewmen.

Lack of fairness in the allocation of jobs was a major concern among some engineers. This was attributed to the natural tendency of callers and first-line supervisors to take the path of least resistance by piling work, especially unpopular jobs, on those employees who were most reliable and least prone to complain. "Chronic screw-offs," on the other hand were perceived as less likely to be stuck with undesirable jobs.

The practices of some railroads in continuously adjusting standings and train lineups to minimize costs generates more conflict between callers and crewmen because it often invalidates whatever a crewmen has previously been told by a caller.

Most of the sources of conflict with callers would be eliminated if there were a requirement for a binding advance notice of call (eight or ten hours with penalty for significant changes). Engineers would also like:

(1) Option to mark off at least one week-end per month without penalty.

(2) Option to mark off two days per week without penalty, but limited to low traffic days, typically Mondays and Tuesdays.

(3) Efforts by management to attract more competent employees for crew-calling positions.

4.0 Initiatives For Changes In Crew Management And Scheduling

4.1 Advance Notice of Train Departure Time

Most railroad managers are generally empathetic toward the desires of engineers for better information about the timing of their jobs. Most are planning enhancements to crew-management systems toward that end to be phased in during the next few years.

Better advance estimates of train arrival and departure times are a priority at several roads because they are expected to improve service to customers, facilitate efficient use of equipment and facilities and help avoid terminal congestion as well as aiding crew members in planning their days. Managers also expect significant reductions in costs for away-from-home lodging and deadheading.

Most of the managers interviewed did not offer explicit goals as to how accurate they expected advance departure estimates to become. However Conrail reports that about 95% of its symbol freights are already operating within plus or minus one hour of established schedules. CSX reports percentages in the 90 to 95 range for its intermodal and manifest trains. Unit trains, extras, etc. are not included in these numbers of course.

At the Union Pacific, management has established a goal of producing eight-hour forecasts of train departure times which are accurate to a tolerance of plus-or-minus two hours 90 percent of the time. Some terminals are close to achieving this goal, while others, mainly intermediate stations, have accuracy ratings below 30%. Although considerable progress toward this goal has been achieved since dispatching was centralized, several barriers remain, which apply to all roads.

Of these the most significant and difficult is the poor quality of advance information coming from other railroads and unit-train shippers. They are supposed to provide a day's notice regarding the movement of unit trains or unusual volumes of interchange traffic and do so most of the time. However, when a problem situation arises on another road or at a customer's plant or mine, the individuals involved are quite prone to forget to call the receiving road. Some managers estimated these "problem" situations occurred about 10% of the time. To deal with these lapses, highly automated information exchange systems will be needed to insure that information flows even when the humans who usually handle it are preoccupied with other tasks. Resolution of this problem will likely require networking the dispatching and car-management systems of all of the major railroads.

Other aspects of the information-quality problem include motivating clerks to make required manual inputs in timely fashion and better linking of dark territory to automated information systems.

Despite the trend toward better departure estimates, some managers expressed reservations about making precise estimates available to locomotive crews. They point out that under some circumstances, making information available to crews is an invitation to "dodging" or "sharpshooting." These terms refer to attempts

to avoid calls for undesirable jobs and become available just in time to be at the top of the standings when a desirable run is called.

4.2 Predictable Crew Rotation

Accurate advance estimates of train departure times are only half the solution to providing advance notice of call; one must also know which employees will be available to crew each train. So long as pools rotate on a straight first-in, first-out basis the matching of crew members with departing trains is straightforward. However, if any employees who are supposed to be available for work prove to be unreachable or mark off for any reason after an advance notice is given, then the projected jobs for all other employees who stand after them will change, sometimes by many hours. Complex rules regarding who is eligible to work which job can lead to errors by the crew callers which also disrupt the orderly sequencing of pools and extra boards. Juggling the standings to minimize deadheading or lodging costs, or to satisfy mileage quotas creates further disorder.

Managers and crew callers interviewed for this study reported widely differing experiences regarding the predictability of pool rotation. In some districts, characterized by a strong work ethic, the probability of a given employee's working his predicted turn was estimated well above 90%. In other areas, call-dodging, marking off when called and other problems were common. In the worst cases, the number of calls made per job filled averages more than six, i.e. the probability that any given employee would actually work the job projected in advance was rather low.

In order to increase the probability that a given employee will work his projected job, several options exist. The most obvious is to assign workers to a given job rather than have them take the next available job in a pool or extra board. That way, the unexpected unavailability of a given employee affects only a single replacement worker from an extra board, rather than every other worker in the pool. Almost all yard, local and road-switcher jobs are assigned service. However, among the roads interviewed, only Conrail and CSX had significant numbers of assigned jobs in road freight service, most of them on high-speed intermodal trains. Assigned service is feasible only where trains are run on regular schedules like passenger service, i.e, no cancellations or combinations.

For the bulk of road-freight service, where traffic variability causes substantial schedule variability as well as frequent cancellations, extras and combinations, other approaches are required. Several managers stressed that missed calls can not be tolerated, i.e., discipline must be applied consistently whenever a call is missed. Some also suggested that the information system serving the train crew must be explicitly designed to prevent abuse. This means for example that any employee who has called in sick or marked off for any other reason is not permitted to see standings or lineups until he first marks up again. This restriction is automatic with some voice-response systems, but can not be implemented with simple tape-recorded messages.

Some roads were alleged to tolerate missed calls and call dodging to some extent, although their managers denied this was the case. Where such leniency exists, it provides workers with another means of avoiding work when they are tired. However, it could also substantially complicate the task of trying to provide accurate estimates of when a particular employee will next go to work.

Engineers suggested that the best way to deal with call dodging was to investigate why certain jobs were being avoided and then correct those conditions; such conditions are, excessive delays, poor track, etc.

The Union Pacific is experimenting with a carrot rather than a stick on some of its districts, where management has added to labor agreements a bonus of $356 per month to each employee who remains continuously available, i.e., does not call in sick or mark off for personal reasons. Taking scheduled vacation days does not prevent receiving the bonus. This incentive payment has proven highly effective in reducing call dodging and permitted

the railroad to operate with smaller extra boards in these districts. The smaller size of the extra boards in turn allows the railroad to offer mileage guarantees to the extra-board workers.

Although this incentive plan appears on balance to be advantageous for all parties, management recognizes that it has the perverse effect of discouraging an employee who is actually sick or severely fatigued from marking off.

Minimizing errors made by crew callers is another essential element in insuring accurate advance notice of call. Computerized crew-calling systems appear to be helpful in reducing these errors, although they often suffer significant error rates in the first year or so of operation. Data from Burlington Northern's Denver Division showed that errors of the sort that result in payments to employees were reduced to almost nothing by 18 months after installation. However no data are available for certain types of errors, such as awakening an employee sooner than necessary, for which penalties are not established.

Managers generally feel that the enormous number of local labor agreements, many of them informal, constitutes a major barrier to the installation of a computerized crew-calling system and other improvements in crew management. Thus they seek to accomplish the following in future collective bargaining:

(1) to reduce the number and complexity of agreements;

(2) to increase consistency in work rules across all districts;

(3) to create more long pools;

(4) to facilitate more equitable distribution of desirable versus undesirable jobs; and

(5) to establish stronger penalties for call dodging and other behaviors which disrupt orderly pool rotation.

4.3 Improvements to Crew-Information Systems

As described in Section 2, most roads have added one or more enhancements to their crew-information systems in recent years. Toll-free access to callers and tape-recordings is being supplemented with remote computer terminals and computerized automated-voice-response systems. In a few instances, access through personal computers via dial-up connections or video text on cable television are being tried.

More important than the new media are improvements in the accuracy and timeliness of the information they convey. These are far more difficult to achieve for all the reasons noted above in Section 4.1.

4.4 Extra Rest Options

Extra rest above that required by the Hours of Service Act is allowed to some extent by formal policy on several of the roads included in this study. Engineers on the BN may request ten hours rest whenever they tie up, even if they have not worked more than eight hours. Without consulting any higher officials, BN crew callers and clerks are authorized to allow operating personnel to mark off for 24, 48, or 72 hours at the home terminal, provided that the employee agrees to mark up at the specified time. However, when the railroad is very busy, callers naturally discourage these requests. Focus group participants felt the option for 10 or 12 hours rest should always be available both at home and away.

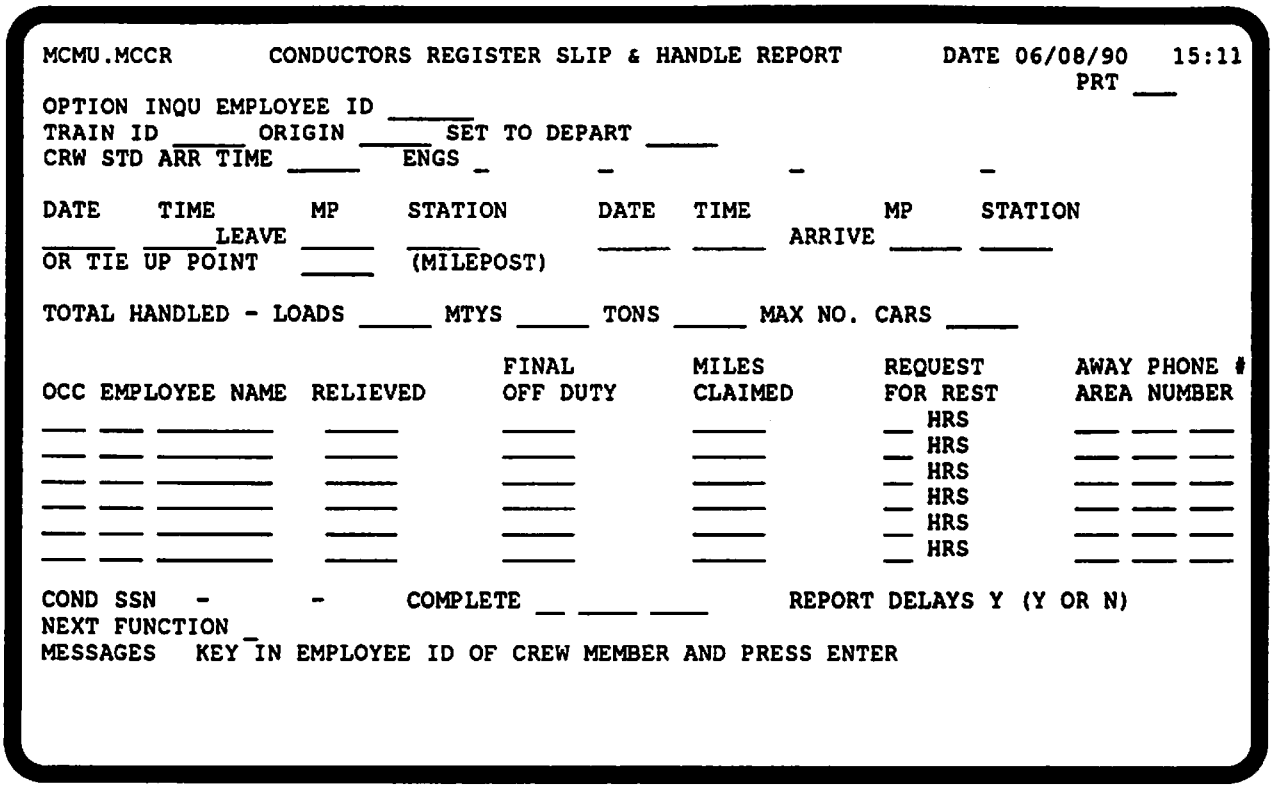


Figure 4.4-1: Handling Report Screen on the CSX, Showing Provision for Extra Rest Request.

On the CSX, certain former L&N employees have long been accorded the right to declare whether they should have eight, ten or twelve hours time off at the completion of a particular job. To do so, they simply key in the desired numbers of hours on the "Handling Report," which is routinely submitted by the conductor as a crew goes off duty. Figure 4.4-1 shows an example of this screen. Extending this option throughout the railroad would be simple from the point of view of hardware and software. However, it might require some increase in employment level, the magnitude of which can not be predicted immediately.

The IC's labor agreements follow the national agreements on holidays and vacation days, but have for many years provided for extra rest on request, referred to as "10 hours undisturbed," which is equivalent to 11.5 or 12 hours off-duty time. UTU employees are guaranteed this extra rest whenever they request it, but there is no guarantee in the BLE agreement. IC management is content with these provisions for extra rest and does not feel that they are abused excessively. Most employees make little or no use of the option of getting extra rest. However a minority do use them consistently or at least consistently at one terminal.

The SP has a long-established practice of allowing rest beyond the requirements of the HSA. Engineers may request 8, 10, or 12 hours off duty. In certain pools, options for 24 or even 48 hours rest are allowed. Although there is no guarantee the request will be honored, denials are rare. Management notes that some employees make use of extra rest much more than others and that most extra-board employees use these requests to avoid low-paying yard jobs. This is not regarded as a serious problem.

Several districts in the UP's Eastern Territory have labor agreements which allow for rest of up to 24 hours between jobs at the employee's discretion. Time-sheet data show that this option is rarely used except on weekends. As a result, extra boards must be sized relatively larger in these districts and productivity (train-miles

per operating employee) is somewhat lower. Management is not disposed toward extending this option to other districts.

In addition to extra rest, other options for scheduling rest were discussed with managers. One of these would require that workers report when they had actually slept to the crew callers, probably twice a day. This data would be entered into the crew calling system. The computer program would have to be modified so that the worker's state of rest was no longer a simple binary variable as to whether Hours of Service rest criteria had been met, but rather a more complex rating indicating how well a work assignment at a given time fits into a particular worker's circadian rhythm pattern. Some managers said that modifying the software and collecting the rest data would not be much of a problem from their perspective. However, they felt that some workers would soon learn to manipulate the system in order to obtain or avoid jobs on given days and that the information they supplied about when they had actually slept would often be untruthful. This view was also supported by engineers and union officials in the focus groups.

Finally, concerns were expressed by several managers that the most significant contributor to severe crew fatigue is not the scheduling system, but rather the irresponsible acts of a small percentage of the work force who pursue certain leisure interests during the time they are supposed to be resting, usually away from home.

4.5 Calling Windows

Another option to make T&E employees' lives more predictable and to facilitate getting proper rest involves sub-dividing the pool crews and extra boards into two or three groups, each of which would be subject to call only during a specified portion of the day, for example AM and PM. The difficulty with this suggestion is that in most pools at current employment levels, the number of names that appear on a caller's screen at any given time is generally not very long, typically five or six. A few of the managers interviewed said that in some of the calling districts on their roads, they could get by fairly well with their pools divided in half this way. They characterized these districts as being predominately rural with a strong work ethic. These are the districts in which it is seldom necessary to make more than one phone call to fill a job.

The majority of the managers said that if the day were divided into even two calling windows, the frequency of situations in which the caller exhausted his list would increase substantially. A three-window system would be much worse. The size of the group eligible for calling at a given time period could be re-expanded by any of several approaches, but each has substantial associated costs and implementation delay time: (1) increase the total size of the work force (this would raise total employment costs and reduce the average earnings); (2) qualify each employee for more runs (training time and cost, and very limited potential because most engineers are already qualified for all runs in their districts); and (3) increase the size of calling districts (longer average commuting time). Even if all three approaches were implemented to a substantial degree, the number of workers available at any given time might still be much smaller than under the current practice.

Most of the managers interviewed felt that the introduction of calling windows would require increasing employment at least 25% and a couple guessed it might be as much as 50%. They stressed that increasing employment would raise operating costs and reduce average earnings. Thus they expected the idea would be opposed by both management and the majority of union members. Some of them also noted that calling windows would sometimes lead to train delays, which would result in additional demurrage and per diem charges and degrade service.

A further objection was that track work, derailments, storms, etc. often result in situations in which a series of several trains must be run in close succession, referred to as "fleeting." Under these conditions, almost all of the qualified operating employees in a given pool may be needed to work at the same time. Calling windows

would severely diminish the railroad's capacity to deal with these situations, unless employment levels were increased substantially.

Calling windows could also complicate meeting monthly milage guarantees under some circumstances. In summary, management was not enthusiastic about calling windows, doubted that labor would want them either, and would accept them in collective bargaining only as part of a package with a significant *quid pro quo*.

4.6 Reduced Working Hours

Proposals for reduced working hours fall into two distinctly different classes, those reducing the number of allowable hours on duty and those reducing the number of hours worked per month or per pay period. For the reasons discussed below, the former are opposed by management, while the latter are embraced when combined with other measures to improve productivity.

A hypothetical reduction in the Hours of Service Act limit from 12 to 10 hours was discussed with some managers. In some districts on some roads, jobs lasting longer than 10 hours are unusual, hence the impact of the change would not be great. However, occasional jobs of 10 to 12 hours are common on most roads whenever, track work, heavy traffic, etc. create delays. If these situations resulted in crews "dying" under a "10-hour" rule, the costs and additional delays entailed in "dog catching" would make these problems all the worse.

For a railroad with a high proportion of long pools like the Southern Pacific, such a change could be catastrophic. Many of the SP runs take eight hours or more even when things are going well. However, bad-order locomotives, maintenance-of-way work, and other types of common problems result in a significant proportion of SP road jobs taking more than 12 hours to complete. Hence, an unusually large fraction of crews die under the HSA. On most days more than 20 crews die more than 25 miles from their destination terminals and thus require "patching" (elsewhere known as "dog catching"). A much larger number die within the yard limits of their intended destinations; their trains can be brought in by yard crews. (SP engineers at a focus group estimated that a third to a half of their runs were brought in by yard crews; management retorted that this was an exaggeration.)

Because of the situation described above, the SP would suffer severe adverse impact if there were any reduction in the number of hours a crew could work. A ten-hour rule could result in the majority of through-freight crews "dying." Management was thus quick to express its concern about the possibility of any such change in regulation.

The alternative approaches to reducing working hours through increased productivity are naturally viewed much more favorably by management. Increasing the number of miles travelled on a job is the most widely used method of increasing productivity. Typically, adjacent districts are simply combined so that run lengths are approximately doubled. Since crewmen are paid for the most part on the basis of miles travelled and are allowed some quota of miles established by agreement with the union, those in long pools work fewer jobs per month. The Burlington Northern estimates that engineers in long pools work an average of 45 hours per week, while those in short pools average 55 hours.

Not all managements are inclined to add more long pools however. The Illinois Central, for example, has only two longer than 200 miles. They work well because they can usually be completed in six or seven hours. However, on most parts of the IC, a 200-mile run would take eight hours or more with everything going well. Any of the common problems would push a crew to their 12-hour limit. Management views runs with a significant incidence of "dog catches" as bad business both for the extra costs associated with providing relief and because of the resulting poor schedule reliability.

Several managers commented on the tendency of some pools to exceed mileage quotas consistently. In most labor agreements there is a monthly mileage quota, typically 3600 to 3900 miles, for engineers. Local chairmen and managers are supposed to adjust the number of engineers in the pool at frequent intervals so that the actual mileages stay close to these quotas. At some roads, the decisions are effectively left to the local chairmen. For the most part, pools stay close to their quotas, but this is not always so. In some locations, a shortage of engineers leads to working over quota. However in other districts, the overwork has nothing to do with any shortage. Instead, it must reflect the desires of the senior membership to earn as much as possible, referred to as "money hogging."

Reducing time spent in commuting to and from jobs was also viewed as an important element in minimizing fatigue. Because of the numerous reorganizations that have taken place in recent years, many employees are reporting to work a substantial distance from their homes. Some railroads offer moving allowances and other incentives to move to the new reporting terminal, but many employees have personal ties to their present communities. Adjusting to reorganizations can easily take a decade.

Southern Pacific management brought up a proposal for a major policy change which could offer substantial gains in productivity as well as mitigation of fatigue. This change amounts to adopting the "airline model" of compensating operating employees. Under such a policy, engineers and trainmen working in pools or yard/local assignments would be offered a relatively constant monthly salary in exchange for the performance of a specified number of hours of work. Overtime hours would be limited to a modest amount. Such an approach would remove most of the complex rules for compensation currently in force as well as most penalty payments. Working extremely long hours ("money hogging") would be impossible under this system. Accommodating busy periods would be more difficult because of the limitations on hours under this plan, but extra boards and reserve boards would be maintained. Other managers agreed that there is a trend toward establishing earnings guarantees, and that eventually, salaries for operating employees may become the norm.

4.7 Redistribution of Work within the Locomotive Crew

Several aspects of current labor agreements tend to frustrate the efficient utilization of manpower and thus contribute toward fatigue to some extent. For example, when business increases, management would like to be able to increase the sizes of engineer pools quickly by promoting trainmen who are already thoroughly familiar with the territory. However, because the current wage structure provides very little incentive to accept the promotion and because they would go to the bottom of the seniority roster if they did so, very few older trainmen will accept jobs as engineers even when they have all of the necessary technical skills and familiarity with a division. Hence, most new engineers are recruited from the younger trainmen, who require about six months of training before they can be fully qualified.

Some railroads are seeking in collective bargaining to create co-engineers who are qualified to relieve the engineer for a substantial proportion of any given run. Such changes could result in substantially less fatigue among engineers, especially on longer runs. Although this policy is welcomed by the engineers, it is being resisted by the UTU as a threat to the very existence of that union.

Because a rationalization of workload within the train crew threatens the rights of so many workers, collective bargaining tends to lead to very gradual introduction of such changes. The 1985 national agreement specifies that all trainmen hired after 1988 are required to accept promotion to engineers. Those who are unable to pass the examination are subject to dismissal.

Several managers expressed a desire to increase salary differentials between engineers and trainmen in order to create incentives for the conversion of trainmen to engineers or co-engineers.

APPENDIX A

Glossary of Crew-calling Terms

This glossary is based almost entirely on glossaries prepared by Burlington Northern and CSX staff members. BN terms are represented by initial caps, while CSX terms are in lower case. These glossaries were shown to managers responsible for crew calling on other railroads, who were asked to comment. Their comments were minimal, principally to the effect that they used similar terminology. A few additional terms were suggested, which are italicized herein.

Some of the interviewees noted that there are cases of different words with the same meaning and some cases of similar words having different meanings because of the development of crew calling along separate lines of the different properties before consolidation.

abeyance	See "held-in-abeyance."
abolish	to permanently eliminate an assignment. Contrast with "annul" and "lay in."
Abolishment	Permanent discontinuance of a regular job or crew assignment. A bulletin is required to reestablish the assignment.
Accumulative	Method of totaling time an employee is in a selected status such as To Place. Time is totaled until employee changes status. The time count is then halted until employee returns to original status. Total time equals the time spent in original status only.
additional service list	a list of yard employees requesting additional work on their rest days, rotating in first-in-first-out sequence. See also: "engineers' supplemental list," "firemen's rotating board," "overtime list."
advance call	the amount of time as specified by applicable agreement that is required between the time of employee notification, the calling time, and the start time of the assignment. "Calling time requirement".
advertise	to solicit employees to bid on an assignment.
advertised start time	The on-duty time of an assignment as established by an advertisement.
age roster	see "seniority roster."
Aggregation	Time-on-duty situation that occurs when crew is called on duty with less that 8 hours, but greater than 4 hours rest. Total time on duty in this case equals length of time on duty previous trip and total time on duty trip called for.
Agreement	Written rules or contract between railroad and union that prescribes work rules for one or more crafts. Can be either system-wide or apply locally only. Agreements must be signed by authorized representatives of both the union and management.

allocation table — a table established by contract for the purpose of determining the relative position of employees of the same craft but different seniority districts. The table consists of sequentially numbered 'slots.' The contract specifies the slots allocated to each seniority district. Employees involved are matched to the allocation table to get an Order Selection List (OSL) number. The most senior employee in a particular seniority district holding an assignment covered by the allocation table receives the first OSL number designated for his district. The next most senior employee involved from that same district covered by the allocation table receives the next number allocated to that district, and so on. An employee with a lower OSL number is ranked above an employee with a higher OSL number, even if the employee with the lower OSL number has a more recent seniority date than the employee with the higher OSL number.

annul — to deactivate a job for one day. See also "lay in." Contrast with "abolish."

Annulment — Temporary discontinuance of a regular job or crew assignment. Assignment is not abolished and employees are paid for lost wages as if they worked assignment. Example is when an assignment is "layed in" for a holiday.

Arbitraries — Item or Items on a time slip submitted by TY&E employees to claim additional pay. Claims are sent to timekeeping offices and forwarded to crew calling by them if claim was made in connection with an error on calling procedures. One example would be when a TY&E employee is not called in the proper order and a runaround claim results.

arrive — to bring a road assignment to or past some specified point. The specified point for crew calling purposes frequently is different than that used for TMS and TYMS purposes. Contrast with "relieve."

Arrival Time — The time the train stops on it's designated track within a yard, as reported on the train activity/delay report submitted at the conclusion of each trip by the conductor. Used in some cases as a placement time on a crew board and must be keyed into the tie-up screen in the CMD system.

assignment — the extra board, pool or regular job to which an employee is permanently assigned.

Assignment — A scheduled job on which an individual or crew has designated work responsibilities.

assignment, extra — an assignment that is not regularly established. This is not the same as an assignment to an extra board.

assignment number	the number of an assignment as used by the crew calling or crew management system. The assignment number may have little or no relationship to the "train number."
assignment, parent	the assignment whose rest days are covered by a swing assignment.
assignment, pool	an assignment as a member of a pool crew.
assignment, regular	the permanent assignment of an employee. An employee having a regular assignment to an extra board might have a temporary assignment to fill a vacancy.
assignment, relief	another term for swing assignment. See "assignment, swing."
assignment, swing	a yard assignment used to protect the rest days of another assignment, the parent assignment.
Auto Call	The situation where the crew calling system automatically indicates that an individual or crew has routinely reported for duty at the scheduled time without receiving specific notification to report from a crew caller. Also referred to as "show", "shine" or "report".
Automatic Mark Up	The action automatically taken by CMD to return an employee to an active working status at a specified date and time, predetermined by the crew caller and employee.
available	marked up, rested, and usable.
Award	Written notification that a successful bidder has been assigned to a job or crew.
Away-From-Home Terminal	A designated terminal on territory where crews of a seniority district operate to, which is on the end opposite that seniority district's home terminal.
Bereavement Leave	Layoff not to exceed three calendar days requested due to the death of an immediate family member which is defined as a mother, father, brother, sister, children, mother-in-law, father-in-law, half-brother, half-sister and spouse.
bid	a written or verbal request which, if awarded, allows an employee to move to particular assignment or position on an assignment, or to hold particular rest days. Bids are awarded on a seniority basis.

Bid — Written request received from an employee for permanent or temporary assignment to a job, crew or extra board position.

Blankable Job — A position on a crew that need not be filled by an extra employee if the regularly assigned employee is not available for duty. Normally, firemen and brakemen are on blankables.

blankable position — 1. the second brakeman/helper position on a standard crew which could be operated as a reduced crew in the absence of the second brakeman/helper under certain conditions, and which has been filled by a protected employee. 2. a fireman/reserve engineer position which may be operated unfilled under certain conditions.

blanked position — 1. an unfilled second brakeman/helper position on a crew working as a reduced crew. 2. an unfilled fireman/reserve engineer position which may be operated as such.

Board Adjustment — An increase or decrease In the number of crews or extra employees assigned to a board or pool to provide average days or miles worked within established minimums and maximums. Controlled by mileage checks and performed by either the company or union representative.

brakeman — a train service employee who assists with train and yard operations. This term excludes conductors/foremen.

Brakeman — Member of train crew who works under supervision of the conductor.

brakeman position — a position on an assignment which may be filled by a brakeman.

brakeman 1 — another term for flagman. Contrast with "first brakeman."

brakeman 2 — another term for head brakeman. Contrast with "second brakeman."

Build Up Turns — Turns which are created when a pool has no rested crews to operate a train over a given territory. May consist of extra employees or a crew from another pool.

Bulletin — Written notice posted at TY&E reporting locations that announces the existence of a job, crew or extra board vacancy on which bids for assignment will be accepted. They indicate, in part, how long bids will be accepted for and effective date and time of assignment.

Bump

An exercise of seniority by a senior employee who displaces a junior employee and accepts the responsibility of the position assumed. Notification of a bump may be submitted to a crew caller either in written form or verbally, depending on location policy.

bump

displace or roll a junior employee (one with less seniority or with a higher OSL number) on an established assignment or position on an assignment. The following types of bumps or rolls do not apply at all locations or to all crafts.

bump, 1 day

a method of exercising a seniority move. The option to move to another assignment in the same class of service for one day while the employee's original assignment is annulled for one day. Same as "roll, 1 day".

bump, 10 day

a method of exercising a seniority move. The option to move to a position on another pool assignment within the same pool after having been on the same pool assignment for at least ten days. Same as "roll, 10 day".

bump, 14 day

a method of exercising a seniority move. The option to move to a position on another assignment after having held a position on the same single assignment for at least fourteen days. Same as "roll, 14 day".

bump, 30 day

a method of exercising a seniority move. The option extended to all employees in a particular seniority district and craft once a month to move to positions on other assignments or to retain their positions. Same as "roll, 30 day".

bump, 60 day

a method of exercising a seniority move. The option extended to all employees in a particular seniority district and craft once every other month to move to positions on other assignments or to retain their positions. Same as "roll, 60 day".

bust the call

see "cancel the call".

Call

The process of notifying individual crewmen of the date, time and position of their work assignment to which they are to report.

Called and Not Used

A situation where an employee has already been notified to report for duty and the work requirement ceases to exist. Employee is advised his services are no longer required and proper placement is governed by called and not used rules.

called down

see "cancel the call".

called job

an assignment for which the crew members receive a notification of the time to report to work each time they are to be used.

called on one's rest — an employee or crew called while in resting status with instructions to report on duty at the termination of the rest period.

caller — see "crew caller."

calling cycle — the time period during which yard vacancies are filled.

Calling Limits — Established one mile limit that employee must live within before shag requirement is used.

calling time — the time at which an employee should be notified of an assignment, based on the assignment start time as adjusted for set back or move ahead, made earlier by the amounts of preparatory time, deadhead time, and the calling time requirement, as applicable.

Calling Time Limit — Amount of advance notification that employees must be given prior to the on duty time of train or job to be protected. This notification time varies per locations and craft, however, is usually one to two hours, independent of deadhead lead time and rest requirements.

calling time requirement — the amount of time as specified by applicable agreement that is required between the time of employee notification, the calling time, and the start time of the assignment, e.g., if the calling time requirement is two hours, then an employee should be notified at 1:30 to fill a 3:30 vacancy.

cancel the call — to abolish a called assignment before it goes on duty.

chain gang — another term for train pool.

Chain Gang — A pool of crews protecting unassigned service with a specified home and distant terminal which are worked on a first-in, first-out basis.

Cit Off — A status wherein an employee, due to displacement or reduction in force, no longer has sufficient seniority to hold a position within zone he or she was working. Does, however, have sufficient seniority to hold a position within the seniority district.

claim — to move to a position on an assignment by a particular method of exercising seniority with the intention of owning that position on a permanent or temporary basis.

Class of Service — Type of work performed while on duty. Can be categorized as yard service, through freight, local, road switcher, etc.

coach hostler — see "hostler herder."

combined pool — a group of crews consisting of engineer, fireman, conductor, and two brakemen. A crew is not assigned to a particular train but rather is used on a first-in-first-out, as needed basis.

combined pool crew — any one crew in a combined pool.

Conductor — A member of train crew who has overall responsibility for operation of the train.

conductor — a promoted train service employee in charge of train or crew. In yard service may also be called foreman.

consolidated seniority — a seniority district made up of former district seniority districts or prior rights zones.

Continuous — Method of totaling time an employee is in a selected status such as To Place. Time is totaled until employee changes status. The time count is then halted and begins over when employee returns to original status.

Continuous Time — Time-on-duty situation that occurs when crew is called on duty with less than 4 hours rest. Total time on duty equals length of time on duty previous trip, plus rest time (tied up for less than 4 hours - see aggregation for more than 4 hours) and total time on duty of current trip.

Craft — Classification of employees by type of duties, ie, enginemen (engineers, firemen, inside hostlers and outside hostlers), trainmen (conductors and brakemen) and Yardmen (switchmen, foremen, helpers, herders).

craft — the individual occupational groups with which labor agreements are usually written, that is, engineers, reserve engineers, firemen, conductors, and brakemen.

Crew — A combination of the appropriate number of employees who possess the qualifications needed to operate a train or engine.

crew — the individuals working on an assignment. Unless specifically described as engine crew, train crew, etc., the term crew will mean all individuals on the assignment.

crew caller — an employee who notifies train and engine crews to report for duty. See also "foot caller."

Crew Calling — The composite process of assembling and scheduling individual TY&E employees to man work assignments, such as trains and yard switch engines.

Crew Consist	The number of employees and employee qualifications which comprise a crew.
Crew Consist Agreement	Refers to agreements negotiated between the company and unions whereby trains meeting certain physical characteristics may be staffed by one rather than two brakemen.
crew dispatcher	another term for crew caller.
Crew Sheet	Printout or display of entire TY&E personnel working jobs, crews or extra lists, indicating the times and days that the jobs work or order In which will be used to protect unassigned service. Run daily by crew calling for a manual backup in case of system failure.
Crew Swap	Action within the CMD system to identify that an individual or crew was called for one specific train and due to operations either in the yard or on the road (i.e., parked one train and picked up another) tied up with another train.
cut back	to change an employee from engineer status to fireman or reserve-engineer status.
cut off employee	an employee who does stand for an assignment on either his prior-right zone or his consolidated seniority district at the location where last displaced and who does not elect to exercise seniority to an assignment for which he stands at another location that has a reporting point in excess of 30 miles from the reporting point of the location where last displaced.
cut-off point	a number equal to the number of positions on assignments that are available to be held.
Daily Markup	The process under NP and CB&Q rules whereby switch engine jobs for yardmen are awarded on a daily basis.
Dead Under Hours Of Service	Employees who have performed continuous service for a maximum of 12 hours during a tour of duty.
Deadhead	The process of moving an individual or crew, in a non-working status, from one location to another.
deadhead	trainman or engineman moved without performing service, from one location to another at railroad convenience. Deadhead service may be either paid or not paid. See also "deadhead continuous" and "deadhead separate."

deadhead combined See "deadhead continuous."

deadhead continuous to travel to the place of assignment and then work the assignment without an intervening eight hour rest period. This deadhead time is counted toward on-duty time of assignment deadheaded to work.

deadhead separate to travel to the place of assignment and then work the assignment with an intervening eight hour rest period. This deadhead time is not counted toward on-duty time of assignment deadheaded to work.

Decision Tables Steps that instruct the CMD system which employee to present for a vacancy fill.

Delay Report Slip submitted by TY&E employees at the conclusion of a tour of duty to indicate a detailed report of activities which occurred. Used by crew calling operations to supply pertinent data to CMD system.

Demoted An employee qualified to work a higher rated job, i.e., an engineer vs. a fireman or conductor working as a brakeman, but is currently working a lower rated position either because of insufficient seniority or by choice.

demoted engineer an engineer who can no longer hold an engineer's assignment because of a reduction in the number of assignments.

Departure Time The time normally specified by the conductor on the delay report that a train first pulls on track to depart a given terminal. Used to determine runarounds en route and must be keyed into the CMD system upon tie-up through information received on a crew's delay report.

Dismissal The result of a formal investigation wherein an employee Is dismissed from the service of the railroad and has no work privileges for an indefinite period of time.

Dispatcher An employee who controls and directs the movement of trains.

displace exercise seniority rights over a junior employee onto the junior employee's assignment.

displaced to have lost one's assignment through either bump or assignment abolishment. See also: "misplaced".

dog catch see "hours of service relief crew".

Dog Catching Short turnaround service to relieve crews that have died under the Hours of Service Law wherein a train and engine crew is sent to relieve the crew.

dog law — see "hours of service law."

dovetail — a method of combining two or more prior rights zones into a consolidated seniority district. The employees are placed on the consolidated roster in straight-seniority date order without regard to prior-right-zone priority.

Emergency Board — Listing of employees who may be used to protect vacancies when extra board personnel are not available.

emergency conductor — a qualified conductor not holding a regular assignment as a conductor.

emergency engineer — a fireman who is qualified as an engineer but has not established a turn as such. (not a former-B&O rule 29D man)

emergency furlough list — a list of furloughed employees who may be used to protect service in their respective seniority district. Employees are used off emergency furlough lists in seniority order.

emergency service list — furloughed trainmen who have submitted written requests to protect service in their respective seniority district. Employees are used off emergency service lists in seniority order.

Emergency Work — Work opportunity that exists when there is a vacancy and no regular extra employees are available to protect.

engine crew — the engineer on the assignment and the fireman/reserve engineer if there is one.

engine delivery service — a crew whose task is to deliver light crew engines to a point on line of road or to another terminal.

engine peddler — a three man crew, engineer, fireman, brakeman/helper, whose task is to deliver or retrieve light engines within yard limits.

engine pool — a group of crews of engineers or of engineers and fireman/reserve engineers. Engine pools generally rotate on a first-in-first-out basis.

engine pool crew — any one crew in an engine pool.

engine relief — another term for engine peddler.

Engineer — A member of a train or yard crew who is primarily responsible for the operation of the locomotive.

engineer — an employee qualified to operate locomotives in other than hostler operation.

Engineer Trainee — A fireman (helper) who is receiving classroom and on-the-job training designed to develop the qualifications needed for promotion to locomotive engineer.

engineer trainee — an employee that has entered training for employment as engineer under the jurisdiction of the Road Foreman of Engines.

engineer's position — a position on an assignment which may only be occupied by an engineer.

engineers' supplemental — a list of regularly assigned yard list engineers requesting yard work on rest days. See also: "additional service list," "fireman's rotating board," "overtime list."

Enginemen — A terminology used for grouping employees who are responsible for the movement of locomotives. Engineers, firemen and hostlers are included.

Equalization — The proportionate allocation of work between seniority districts when the employees of one seniority district operate in or over the territory of another district. Mileage regulations use this method frequently with active/inactive pools.

equity — a fair allocation of the number of assignments or positions on assignments that are available between the different seniority districts protecting such work, usually based on percentages of the work done in the past.

extra board — a group of employees, either engineers, firemen/reserve engineers, conductors, brakemen, or trainmen, which has been established by contract to cover temporary vacancies in their respective craft and seniority districts. Extra boards rotate on a first-in-first-out basis.

Extra Board — Listing of extra employees who are used to protect positions of assigned employees that are unavailable for work.

extra crew — a crew assembled from employees taken individually from extra boards or other such sources, as opposed to a pool crew.

Extra Job — An unscheduled job that is worked, as needed, to accomplish work that is beyond the capabilities of regularly assigned jobs. Extra jobs are normally manned by extra crews made up of extra board employees.

Extra Man — Employee who is not regularly assigned to a job or crew, and is used to protect the positions of assigned employees who are temporarily unavailable for work.

Extra Train — An unscheduled train that is operated to accomplish work or move tonnage that is beyond the capabilities of regularly scheduled trains. Extra trains could be manned by either pool or extra crews.

failure to report — the failure of an employee properly called or assigned to a show up assignment to report for work.

fast freight — a class of service on the former-L&N.

Final Terminal Delay — A penalty that is payable to crewmen for management's or their own failure to tie up their train after reaching a point either at the entrance to the yard or a designated track for yarding the train. Must be reported into the CMD system upon tie-up from information received on the delay report.

final terminal delay — time after the train has "arrived" measured from the time the train reaches some locally agreed point, usually a yard board.

Fireman — A member of train or yard crew who is under the direct supervision of the locomotive engineer and assists in the operation of the locomotive. A fireman may or may not be a qualified engineer.

fireman — an engine service employee who is neither a former-L&N engineer nor an engineer trainee, and who is either not promoted to engineer or is promoted to engineer but is currently cut back from engineer status.

fireman's position — an engineman's position which may be filled by a fireman.

firemen's rotating — a list of former-C&O firemen and board hostlers who have made application for work other than on their regular assignments. Employees originally marked up to the board in seniority order but are thereafter used in first-in-first-out order. This work is not limited to rest days.

first brakeman — the required brakeman's position on an assignment with a blankable brakeman's position. Contrast with "brakeman 1."

First-In — The crew or individual who has the earliest board placement time.

First-In, First-Out — Board or extra board rotation process by which the crew who has the earliest placement on board from previous trip is the first one selected to satisfy a work requirement.

first-in-first-out — the method of rotating the relative standing on a list or in a pool. It means the first one onto the list will be the first one taken from the list.

first-out — the employee or crew on a rotating list or pool which is next to be called for service. Contrast with "oldest."

first pool — the group of former-L&N First Pool Engineers. They are used to protect road service runs,

first pool engineer — former-L&N engineer holding a position in the First Pool.

first pool reserves — the group of former-L&N First Pool Reserve Engineers. They are used in reserve engineer pool service.

first pool reserve — former-L&N reserve engineer holding an Engineer's position in the First Pool Reserves.

fishing pool — another term for the reserve engineers guaranteed extra board.

five day known vacancy — a type of vacancy to which a former-L&N engineer or reserve engineer may make a seniority move. The vacancy must have already been vacant for at least five days or it must be known that the vacancy will be vacant for five or more days.

flagman — the member of a standard crew responsible for work done in connection with the rear section of the train, especially, in territory where designated, protecting the train from any following trains. This term does not apply to any member of a reduced crew.

foot caller — a caller who actually goes to where the train or engine service employee is located for the purpose of calling. Where used, they are required by contract at locations without a telephone within one mile of the crew caller's office.

Footboard Yardmaster — A yard foreman who is instructed to act in the capacity of yardmaster.

Force Assigned — The arbitrary assignment of the appropriate employee to a bulletin position when no bids for the position are received.

force assign — to place a junior qualified employee on an assignment for which no bids were received.

Foreman — A member of a yard crew who has overall responsibility for the performance of a yard crew's assigned work, including the supervision of the enginemen and other yardmen on the crew.

Former Road — A pre-merger railroad which a TY&E employee was affiliated with.

fourteen-day bump — see "bump, 14 day."

fourteen-day roll — see "bump, 14 day."

FTD — See "final terminal delay".

Furlough — A status wherein an employee, due to displacement or reduction in force, no longer has sufficient seniority to hold a position anywhere within the seniority district.

furloughed employee — an employee whose seniority does not entitle him to hold an assignment on his seniority district.

furlough list — a list of furloughed employees.

General Chairman — A union's designated representative for a group of employees within a specific geographical area.

gouge — to recover mileage from an engineer by holding him out of service because the engineer worked miles in excess of contractual limits in a previous month.

guarantee pay — the amount of wages to which a qualified employee is entitled, subject to certain conditions.

guaranteed extra board — an extra board on which the holders of assignment are guaranteed a specific amount of pay provided they meet certain conditions.

Guaranteed Extra Board — An extra board that is insured a minimum number of days' pay regardless of the number of days actually worked.

head brakeman — a member of a standard crew responsible for work done in connection with the forward section of the train. In transit, a head brakeman would usually be stationed in the locomotive. This term does not apply to any member of a reduced crew.

head man — another term for head brakeman.

held-in-abeyance — an assigned reserve engineer who has been held off of his assignment in anticipation of possible use as an engineer or hostler.

helper — yard brakeman.

Helper (Switchman) A member of a yard train crew who works under the supervision of the engine foreman.

Helper Service A job wherein one or more locomotives are used to assist a train over a severe grade, including mountain grades. Crew consists of one engineer and one fireman, brakeman or conductor.

herder see "hostler herder."

Herder A yardman (switchman) who is a qualified and promoted foreman that lines switches for the intra-terminal movement of trains and on-track maintenance and hoisting equipment within the yard.

Hire Date Date employee was first employed by the railroad and began training for qualification within the craft hired for.

Hog Board A seniority board that does not rotate on a first-in/first-out basis. Employee with highest seniority date is always placed first out upon arrival.

hog law see "hours of service law."

hold to own a position on an assignment either on a permanent or a temporary basis.

hold down the use of displacement rights to claim an advertised vacancy; to be assigned to or apply to hold a vacancy for a period of more than one trip.

Hold Off A situation in which an employee is not permitted to work his regular assignment for a certain period of time. Cases where he may be held off include: missed calls, laying off on call, excess miles or held off to protect another class of service, such as a fireman held off to be used as engineer.

Home Terminal A designated terminal on the territory over which the crews of a seniority district operate that is the originating point for service performed.

hostler the assignment, usually to an engineman, especially firemen, operating light engines in designated enginehouse territory working under the direction of an enginehouse foreman. Same as: "inside hostler." Contrast with "outside hostler."

Hostler Enginemen who are responsible for the operation and movement of locomotives within designated mechanical areas (Inside hostlers) or beyond the limits (outside hostlers). They are not in all cases qualified to operate locomotives outside of yards.

Hostler Helper — Employee who assists an outside hostler in the movement of locomotives within and beyond the limits of designated mechanical areas.

hostler herder — the conductor's position on an outside hostler assignment.

Hours of Service Law — A federal law which limits the number of hours that TY&E employees may be required or permitted to work. Maximum time is 12 hours obtained consecutively, in aggregation or continuous time. After 12 hours of performing service, must have at least 8 consecutive hours of rest.

hours of service law — the Federal statute which provides that all train and engine crews must be relieved after having been on duty a total of 12 hours.

hours of service relief — a crew whose task is to provide relief crew for another crew tied up under the hours of service law.

Independent — Method of totaling time an employee is in a selected status such as To Place. Time is totaled starting when employee first enters status and continues regardless of any status change employee may enter, until he returns to active status.

Initial Terminal Delay — A penalty that is payable to crewmen when a train fails to depart a terminal within so many minutes of their on duty time, usually 90 minutes. Must be reported into the CMD system upon tie-up of the crew through information received on the delay report.

inside hostler — see "hostler."

Interdivisional Service — Service in which one crew operates a train over a territory which formerly required two or more crews.

interdivisional service — through freight service that operates runs over two or more divisions or seniority districts.

Job — A train, yard engine or other work requirement that is protected by an assigned crew or individual, a crew from a rotating crew board or an individual from an extra board.

Job Number — A number assigned to a specific job used for identification within the CMD system.

jump up — the act of rearranging a regularly assigned man from his regular assignment to work an earlier assignment. Same as: "reach ahead." Contrast with "step up."

Junior — The employee, of two or more employees, who has the least seniority (latest seniority date).

laid in — an established assignment which has been deactivated for one day, as for a holiday. See "annul."

laid out — an established assignment which had been laid in or annulled and is re-activated.

lay off — mark off.

Last-In — The crew or individual who has the latest board placement time.

Lay Off — The action taken by an employee to temporarily remove him-or-herself from an active working status. While in this inactive status, an employee is not available to protect work requirements unless contacted in an emergency situation.

Lay Off On Call — The action taken by an employee to remove him or herself from an active working status at the time that notification is received to protect a specific work requirement. Penalty for this may result in employee being "held off" for a set period of time.

Lay Off Personal — A reason for requesting an inactive working status (other than illness, death in family, etc.) that is generally granted only if there are sufficient extra employees available to protect projected work requirements.

Leave of Absence — An inactive working status that is formally granted for absences of more than 30 days in duration.

light engine — an engine moving without caboose or cars attached.

light engine crew — a crew whose task is to deliver light engines.

line of road — that part of the railroad between terminals.

Lineup — A listing of trains and jobs with estimated on-duty times that are expected to operate during an 8 to 12 hour period.

Local — A freight train that does station work between its originating and terminating stations. Usually is assigned service and works out of and returns to a given location each day.

Local Chairman — A union's representative for a specific craft at a specific location.

Local Freight Service — The class of train service that sets out and picks up cars at intermediate stations and performs switching at these stations.

Local Service — Any train which does station switching or sets out and picks up cars at three or more locations or performs switching in excess of a set number of hours.

Location — Either a home or away-from-home terminal or an outlying point.

made-up crew — a crew assembled from employees taken individually from extra boards or other such sources, as opposed to a pool crew.

mark off — to report as not available for work.

mark up — to report as available for work.

Mark Up (Employee) — The action taken by an employee to return him or herself to an active working status (same as report).

Mark Up Board — The process of updating board information to reflect the current status of all individuals, crews or jobs listed on that board.

Mileage — The basis used for regulation of some pools and extra boards. Mileage allowed is predetermined by the company and union, usually line miles which is the mileage between two terminals, not including any arbitraries earned.

Mine Switcher — A class of train service in which switching is performed at a mine installation that is served exclusively by a tipple and a series of tracks.

Minimum Layoff Time — A minimum time that an employee may request an inactive working status, established by agreements with some crafts to discourage attempts to avoid undesirable jobs.

misplaced — describing an employee who has been bumped but has not yet exercised his seniority onto a new assignment. See also: "unassigned." Not the same as: "out of place".

miss out — marking off an employee account of not having been able to contact that employee for notification of call. Same as: "out of place".

Missed Call — A situation that occurs when an employee subject to call fails to respond to a notification to protect a work requirement and results in the use of another employee to protect the requirement. Missed calls must be reported to an immediate supervisor.

move up — to change the on-duty time of an established assignment to be earlier than that which is designated for the assignment.

Must Fill Job — Vacancy which is required by law or schedule to be filled in order to operate a train. Examples which are must fills are engineers, firemen on passenger trains, conductors, foremen in yards, and first brakemen positions.

must-fill position — 1. all positions covered by Carrier-UTU agreement except those second brakeman/yard helper positions in road and yard service which may be blanked pursuant to Crew Consist Agreements. 2. The fireman/reserve engineer position in passenger or hostler service.

non-called job — an assignment for which the crew members are expected to report for duty without being called. Some employees do have the right to be called for a non-called assignment. Same as: "show up job"

non-prior right employee — an employee on a seniority district with a seniority date subsequent to a consolidation of districts into that seniority district. (e.g.: former-C&O consolidated trainmen's rosters after May 21, 1982.)

non-protected employee — employees hired subsequent to a protective agreement. (e.g.: former-B&O trainmen subsequent to June 14, 1982; former-L&N trainmen subsequent to February 1, 1986; former-WM trainmen hired subsequent to September 2, 1986; former-B&O firemen hired subsequent to July 19, 1972.)

Notification — The action taken to inform employees of changes in their working status. Generally, assignment and bump notification is verbal, job abolishment and annulment notification is written.

oldest — the most senior employee in comparison with other employees on the same seniority roster (straight or consolidated) or Order of Selection List. This is determined using such criteria as seniority date, promotion date, seniority district, prior rights, and/or Order Selection List number. Contrast with "first-out."

On/Off Duty Point — The designated location where a crew reports for and is released from duty.

one-day bump — see "bump, 1 day."

one-day rolls — see "bump, 1 day."

Open Hole — Permanent vacancy which is under bulletin or to be bulletined. In CB&Q, displaced employees may bid vacancy and protect as if assigned for the life of the bulletin. NP employees may also mark to the job and it is considered no longer open.

open position — a position on an established assignment that is available for claim on a permanent or temporary basis.

Open Turn — Position within a turn which is vacant and has no permanent owner. May be occupied by an employee who has displacement rights and places upon turn for duration of bulletin.

Option One Employees — Limited rights protected employees (brakemen) who have rights to only "must fill" vacancies and assignments in yard service and on trains of 71 cars or less in road freight service. They do have rights to blankable and must fill vacancies on trains of more than 71 cars.

Option Two Employees — Borrowed, non-protected employees (brakemen) who do not have the right to exercise seniority to or otherwise be used on blanked or blankable second brakemen or second yard helper positions.

orange book — an agreement describing various guarantee items.

Order Selection List — the number indicating the relative number position of one employee in relation to another employee of the same craft but not necessarily of the same seniority district, both working in the same yard, for use in determining right to an assignment. See "allocation table" for the method of determining the OSL number.

OSL number — See "Order Selection List number."

out of place — marking off an employee account of not having been able to contact that employee for notification of call. Same as: "miss out". Not the same as: "misplaced".

Outlying Job — A job that has an on/off duty point at a location other than in the home terminal of the seniority district to which the job belongs.

outlying point — a reporting location for an assignment where no extra list is maintained.

outside hostler — a two man crew, hostler (fireman) and conductor/foreman, used to deliver engines from and bring them back to the engine house facility. Contrast with: "hostler."

overtime list — a list of employees requesting extra work on their rest days. See also: "additional service list," "engineers' supplemental list," "firemen's rotating board." Overtime lists basically rotate on a first-in-first-out basis although the order of marking up to the list may be controlled by seniority.

parent assignment — see "assignment, parent."

Past Practice — A work rule or agreement that, although unwritten, has resulted from an undisputed application over a period of time and is assumed to be mutually acceptable to both the railroad and the labor organization involved.

Patching — SP term for "dog catching."

Pending A Call — A status which a call to an individual may be placed when an employee has not been actually contacted.

Permanent Bid — Listing of job selections in preference order kept permanently on file and referred to in the event the employee is displaced or a vacancy exists for immediate placement.

Permanent Vacancy — A vacancy created when an employee has been, or it is reasonably certain that he will be, absent for 30 days or more. Permanent vacancies are filled with a new owner and previous owner usually returns with displacement rights.

Personal Leave Days — Days allowed to road trainmen in lieu of paid holidays, for which payment is received, based on continuous service dates with Burlington Northern Railroad. Requests for personal leave days must be submitted in writing and actual layoff documented by crew caller within the CMD system.

pilot — an employee assigned to a train when the engineer or conductor is not qualified on the physical characteristics or rules of the railroad or portion of the railroad.

Pilot Service — Service performed by a qualified conductor or engine foreman in the movement of a lite engine over the road or within a terminal. Also, service performed by qualified conductors or engineers in providing guidance to crews who are operating trains over territories they are not qualified on.

pool — a group of crews protecting some service. The crews in a pool will be of one type: engine, engineer, fireman, reserve engineer, train, yard transfer, or combined.

Pool

A grouping of crews (either train or engine) which are used on a rotation basis to operate trains over a designated territory.

pool assignment

see "assignment, pool."

pool crew

any one crew or set of employees, either engineman, engineer, fireman, reserve engineer, trainmen, yard transfer, or combined trainmen and enginemen, which rotates on a first-in-first-out basis with other crews in a pool protecting some service. Employees are assigned to and work with a particular crew in a pool.

position

a post on an assignment (e.g.: engineer, fireman, reserve engineer, hostler, conductor, foreman, head brakeman, flagman, helper, third brakeman, etc.)

Prior Rights

An employee's claim to work a job assignment on the territory of a former seniority district when a consolidated seniority district is created by merging two or more districts. Prior rights may take precedence over seniority dates.

prior rights employee

an employee on a seniority district with a seniority date prior to the consolidation of districts into that district. The prior right employee has seniority rights on his prior right zone over older employees who are not from his prior right zone. (e.g.: former-C&O trainmen hired prior to May 21, 1982 have prior rights on their prior rights zone.)

prior rights zone

a constituent part of a consolidated seniority district over which employees hired before the consolidation have rights.

Promoted

The process by which an employee who is qualified and has satisfactorily passed the prescribed examinations and is authorized to work a higher rated craft. Firemen, brakemen and switchmen may be promoted and authorized to work as engineers, conductors, foremen, etc.

Protected Rights

Rights allowed trainmen through Crew Consist Agreement, fully protected, option 1 (limited protection), option 2 (non-protected), or "N" (same as option 2).

protects

term used to delimit the assignments which are expected to be covered as opposed to those which are covered in unusual conditions. Protecting also implies a right to the same assignments, e.g., yard engineers' extra board would protect yard engineer vacancies and would have the first rights to fill such vacancies; an assigned yard engineer would only protect his assignment and would only be used on another vacancy if the extra board could not fill it.

protected employee — an employee hired prior to the effective date of a protective agreement. (e.g.: former-B&O trainmen hired before June 15, 1982; former-WM trainmen hired before September 3, 1986; former-B&O firemen hired before July 19, 1972; former-L&N trainmen hired before February 1, 1986 who are not on furlough.)

pull — little used term for bump or roll.

Qualified — Description of an individual who has complied with the specific requirements or conditions of a job or class of service.

reach ahead — to rearrange a regularly assigned employee from his assignment to work an earlier assignment. Same as: "jump up." Contrast with "step up."

rear brakeman — another term for flagman. This term does not apply to any member of a reduced crew.

Recall — The restoration of an employee to an active working status from an inactive status (cut off, furlough) to increase the number of employees maintained in an active working status.

Reduced Crew — A crew that operates with a conductor (foreman) and one brakeman (helper).

reduced crew — a train crew that operates with a conductor/foreman and one brakeman/helper.

Reduction In Force — The cutoff or furlough of a number of employees due to a decrease in work requirements. In a reduction in force, employees are placed in an inactive status in reverse seniority order.

Register — Book in which crews document individual crew members' names, on and off duty times of that tour, terminals operated to and from and the time off duty preceding the beginning of their last tour of duty.

regular assignment — see "assignment, regular."

Regular Man — TY&E employee that works a specific assignment as owner of a job. In yards, employee that is assigned rest days.

Reinstatement — The process wherein an employee is returned to service with the railroad after being dismissed with all or partial work privileges and retainment of seniority.

relief assignment — see "assignment, swing."

Relief Job — A job that is designated to perform the work normally assigned to other jobs on that job's rest days (days not scheduled to work).

relieve — to allow the employees on an assignment to go off-duty. Contrast with "arrive."

Relinquishing Assignment — In some circumstances, an employee can give up (throw-up) assigned service and request placement to another position within his zone. Reference must be made to governing rules as each location and craft may be different. The craft which implements this is mainly trainmen.

Relinquishing Rights — An employee who is qualified and promoted to work a higher-rated craft may give up the right to work that craft. Specifically, brakemen may give up their conductor rights and switchmen may give up their foremen rights. Must be submitted in writing as they may also give up seniority rights.

represents an assignment — an employee is a representative of the assignment if the last previous work of the employee was as a member of the assignment on the last previous use of that assignment, and the employee has not since marked off or layed off.

reserve engineer — a promoted and qualified former-L&N engineman who is assigned to an engineman's position other than an engineer's position. He may be assigned to the First Pool Reserves, filling a reserve engineer's position, on an assignment with an engineer, on a hostler assignment.

reserve engineer pool — a group of reserve engineers which protects vacancies in road, yard, and shop engineer service. They work first-in-first-out like an extra board.

reserve engineer — a position on a former-L&N road or yard position assignment which is equivalent to a fireman position.

respite — rest period or break in service for Hours of Service consideration.

Rest Days — The designated day or days of the week that a crew or job is not scheduled to work.

Rested — The status of an employee who has been off duty for a prescribed number of hours since the end of the last tour of duty.

rested — an employee who has been off duty for at least eight hours plus any additional requested rest time plus any additional rest time required by the hours of service law or by agreement. See also: "undisturbed rest."

rested assignment — as assignment for which each position is in one of the following three states: 1.Vacant or open; 2.Occupied by an employee who does not represent the assignment (See "represents an assignment") without regard to the employee's rest status; 3.Occupied by an employee who does represent the assignment and who is rested.

Restoration To Turn — Occurs after a turn has been runaround en route and has requested to be returned to it's proper location within the pool.

road assigned crew — a crew that is assigned to a particular set of trains.

Road Crew — A crew that operates a train or performs work beyond the boundaries of a terminal.

Road Rotation — Assigned service that protects multiple road assignments and may tie up during the tour of duty at multiple away terminals.

Road Switchers — Freight crew working within a 35-mile radius of a specified location where no yard crews are employed.

roll — another term for bump. The different types of "bumps" or "rolls" are defined after "bump".

run — a road assignment.

runaround — the act of using an employee or assignment which is not first-out to be called before using the proper employee or assignment.

Runaround — Violation of first-in, first-out agreements or other applicable agreements governing the placement of individuals or crews on a board.

Runaround En route — A situation that occurs when two or more crews are called out in the proper order from a terminal and arrive at the opposite terminal in a different order due to actual passing of each other en route in whatever mode of transportation they were called for.

Sadie Hawkins Days — A specific date during the year where TY&E employees can be reassigned within locations in accordance with permanent bids on file regardless of whether currently working at that location and without displacement rights.

second brakeman — the blankable brakeman position when such a position exists. Contrast with "brakeman 2."

Second Pool — the group of former-L&N engineers used primarily to protect vacancies in extra freight and yard service. Employees bid on positions in this pool and rotate in first-in-first-out sequence like an extra board.

Senior — The employee, of two or more employees, who has the most seniority (earliest seniority date).

Seniority Date — The date which identifies the first day that an employee worked in a particular craft on a specified seniority district. Also, with reference to promotion, the date on which an employee was allowed to work a higher ranked position.

Seniority District — Designated territory that an employee's seniority rights are valid within.

seniority district — a group of employees, each of the same union and craft working on the same territory, whose seniority may be used to determine relative ranking.

seniority roster — the list of employees on a seniority district arranged in order by hire date or by some common promotion date.

Separation of Trip — Method of calling a crew or individual or crew when it is desired that they claim deadheading and service performed as separate trips, with a minimum of a basic day's pay for each.

sequence time — the time which determines the relative position of a particular crew within the group of similar crews or an extra board employee on the extra board. Except for newly established crews or extra board positions, the sequence time, as specified by the various agreements, is an arrival or relief time from the last use of the crew or extra board employee.

Service Code — Code within the CMD system to identify what type of service is being accessed by the function/subfunction.

Service Date — Date employee was first hired by railroad and established his first seniority date.

set back — to change the on-duty time of an established assignment to be later than that which is designated for the assignment.

set over — extra men with five or more regular starts.

set up — to change an employee from fireman or reserve engineer status to engineer status. Contrast with "step up."

Shag

Attempt to notify an employee of his assignment by personal contact. He must live within predefined limits from his working location, i.e, one mile from yard office. Used in cases where an employee does not have a telephone or cannot be reached by telephone and lives within calling limits.

Sharpshooting

The manipulative actions that some employees exercise in an effort to work desirable jobs and avoid undesirable jobs.

Shift

The tour of duty of an individual or crew working a job that has scheduled on and off-duty times. Also, the time frame during which scheduled jobs normally go on and off duty.

Shifts

Grouping of yard assignments within a specific time frame.

shop engineer

former-L&N term for hostler.

Short Turn Around Service

A crew used from a terminal to a non-specified point and returned to that terminal any number of times.

show up job

an assignment for which the crew members are expected to report for duty without being called. Some employees do have the right to be called for a show up assignment. Same as: "non-called job"

sixty-day bump

see "bump, 60 day."

sixty-day roll

see "bump, 60 day."

Source of Supply

Any point where road extra boards are maintained.

standard crew

a train crew consisting of a conductor/foreman and two brakemen/helpers.

start count

the count of regular yard starts made by an employee or an assignment.

Start Time

The time that a regularly assigned job is scheduled to go on duty.

Station

A location designated in the timetable by name and number at which a train may stop for traffic, pick up and set out cars or enter or leave the main track.

Station Number

A five-character numeric symbol used to identify locations on the railroad.

step up — to rearrange a fireman/reserve engineer to work an engineer position on the same assignment; to rearrange a brakeman/helper to work the conductor/foreman position on the same assignment. Contrast with "reach ahead," "jump-up," and "set up."

straight seniority — type of labor agreements which allow enginemen to hold either engineer or fireman/reserve engineer assignments or which allow trainmen to hold either conductor or brakeman assignments without regard to a younger employee holding an assignment requiring promotion. Where straight seniority does not apply, all employees above a certain point in the seniority roster must hold assignments requiring promotion and all employees below that point must hold assignments that do not require promotion.

straightaway run — a run from one terminal to another.

supply point — a real or hypothetical location identified by mile post where an extra board is maintained.

Suspension — Discipline assessed an employee after a formal investigation wherein employee is not allowed work privileges for a specified number of days. Employee retains seniority rights, but may also be assessed disqualification to work selected assignments.

swing assignment — see "assignment, swing."

switchman — yard trainman, including foremen/conductors and helpers/brakemen.

Switchman — An employee whose work generally involves the movement of cars within the boundaries of a terminal.

Switchman (helper) — A member of a yard engine crew who works under the supervision of the engine foreman. Crew may have a minimum of one switchman under crew consist agreements, two for a regular crew or a maximum of three.

tag day relief — a regularly occurring swing assignment of less than five days which is filled by extra board personnel.

Temporary Vacancy — A vacancy created by an employee being absent from his job, for any reason, for less than 30 days. Temporary vacancies are usually not bulletined.

ten-day bump — see "bump, 10 day."

ten-day roll	see "bump, 10 day,"
third brakeman	an additional trainman required by the "Full Crew" law, in effect in some states, on road through runs with more than 69 cars, excluding the caboose.
thirty-day bump	see "bump, 30 day."
thirty-day roll	see "bump, 30 day."
Through Freight	The class of train service that operates freight trains between crew change points. This class of service may make pick ups or set outs at intermediate stations, but may not perform station switching.
tie-up	the information about an assignment's arrive and relief.
Tie-up	The action of an individual or crew going off duty.
Tie-up Point	The location where an individual or crew goes off duty.
Times Out	The request by an individual to know his standing or sequential position he is currently occupying on a rotating board. For example, the individual or crew that is standing for the next call to be received is "first out".
Time slip (trip slip)	The form that is submitted by crews and some individual employees to provide the information needed for payroll preparation.
top-to-bottom	method of combining two or more prior bottom-to-top rights zones into a consolidated seniority district. The employees are arranged in seniority order in their prior right zone list and then each prior right zone is placed as a block of employees into the consolidated list. The ordering of the blocks will vary depending upon the use to which the roster is being put, e.g., at Atlanta the former-AJT and former-L&N engineers are divided into five blocks which are arranged into three different orders.
train	an engine or more than one engine coupled, with or without cars. Operating Department rules add the clause "displaying a marker(s)".
train crew	the assigned train service employees. They are usually, but not always, conductor and brakemen.
Train Director	A clerical function which directs train and engine movements within the Memphis Tennessee yard.

Train Number — The symbol used to identify a specific train. This symbol may be comprised of alpha, numeric or a combination of both characters.

train pool — a group of crews composed of one conductor and two brakemen. Employees bid on positions on specific crews and the crews rotate in first-in-first-out sequence to protect service on a specified territory. Contrast with "made up crew."

train pool crew — any one crew in a train pool.

trainman — any train service employee, including conductors/foremen and brakemen/helpers. This term is usually reserved for road employees.

Trainmen — A terminology used for grouping employees who are responsible for the movement of trains. Conductors and brakemen are included.

Turn — A crew that is assigned to a pool.

Turn Around Service — A crew used from a terminal to a specific point and returned to that terminal one time only.

Turn Number — A unique number by pool assigned to each turn within that pool.

turn-around run — a run which works out of a terminal to an intermediate point and returns to the same terminal.

unassigned — an employee at a crew supply point who has no assignment.

Unassigned Service — Service wherein the crews do not have a specific train, on duty time or work schedules. Protected by pool service or extra board. On-duty location does not have pools.

undisturbed rest — a calling condition requestable by a former-L&N engineer or conductor who represents an assignment. This demands that their respective crew will not be contacted for duty until after they have had a minimum of ten hours rest prior to the one hour and thirty minutes calling time allowed before the on-duty time of the assignment.

User Intervention — Terminology in decision table steps to identify circumstances wherein crew caller must manually make a decision as to whom to call for a vacancy. User intervention field contains specific instructions to follow.

Vacate — The process of leaving one's assigned job permanently.

Vacation

Operating employees receive from one to five weeks vacation per year depending on service date. Vacations must be taken in seven-day segments starting on Monday and ending on Sunday unless employee has assigned rest days, in which case vacation starts on first working day after rest days.

Waiting Turn

Situation wherein an employee who is assigned to a regular turn or job, who, for whatever reason did not go out on or with his regular assignment. The individual, when returning to an active status, is then waiting for his turn to come back into the home terminal. Occurs at home terminal only.

Wheeling

The process of moving yardmen after the initial marking of the yard board to protect must fill vacancies in the yard.

work one's way out of the terminal

to be allowed to hold an assignment while one's seniority or Order Selection List number is such that the employee should be cut off or furloughed. An employee working his way out of the terminal will be allowed to hold assignments until he can no longer hold any assignment.

work train

a train used in non-revenue service, such as unloading ballast or laying rail.

Work Train

A train which is called to assist the company's maintenance of way and B&B departments. Crews perform constructive service, such as dumping rock, laying rail, etc.

Work Week

Adjustment period used in regulating the number of employees maintained on a yardmen's extra board, usually beginning with first shift called on Monday and ending with last shift called Sunday. Also, the weekly period worked by a job that has scheduled rest days.

working as

an employee temporarily filling a vacancy on an assignment.

Wrecker Crew

A type of work train called to assist at a derailment.

wrecker service crew

a full sized crew (engineer, conductor, flagman, and head brakeman) whose purpose is to travel to the place of a derailment and assist in clearing it.

Yard Board

A listing of the crews that are assigned to the regular and relief yard jobs that are worked in a terminal.

yard engineeran

engineer in yard service.

yard foreman — a train service employee in charge of a yard crew. Same as "yard conductor."

yard pool transfer — a yard assignment without an established on-duty time that is used primarily to transfer cars from one yard in a terminal to another yard.

Yard Service — Employees who are assigned (or marked up) to switch engines as opposed to road service.

Yardmaster — A supervisor that is responsible for the overall supervision of yard crews working within a terminal.

youngest — the most junior employee in comparison with other employees on the same seniority roster (straight or consolidated) or Order of Selection List. This is determined using such criteria as seniority date, promotion date, seniority district, prior rights, and/or Order Selection List number.

ZZZ Circular 7 Location — A five-character alpha/numeric symbol used by the Missouri Pacific Railroad to identify locations on the railroad. This symbol is comparable to the B operating station number.

1 day bump — see "bump, 1 day."

1 day roll — see "bump, 1 day."

10 day bump — see "bump, 10 day."

10 day roll — see "bump, 10 day."

14 day bump — see "bump, 14 day."

14 day roll — see "bump, 14 day."

30 day bump — see "bump, 30 day."

30 day roll — see "bump, 30 day."

40(b) — the rule in the former-C&O agreement with yard trainmen providing for the use of furloughed employees who have filed a written request for emergency work.

53 B

the rule in the former-C&O engineers agreement which provides for the use of a promoted fireman to fill an engineer vacancy and which allows that fireman to work back to his home terminal as an engineer even though an engineer might become available on the engineers' extra list during the interim.

60 day bump

see "bump, 60 day."

60 day roll

see "bump, 60 day."