

EMPOWERING THE USER TO SUBMIT DB2 REPORTS

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1.0 INTRODUCTION

The Louisiana State University Physical Plant (PPL), which maintains and operates the mechanical equipment on the Baton Rouge campus, contacted Administrative Information Systems (AIS), a department within the Division of Computing Services at LSU, in order to develop an integrated tracking system for its employees and equipment. Although a limited PC system was in operation, an extensive Information Management System/ Data Communications (IMS/DC) and DB2 online system was developed. To support the IMS/DC system, a pilot online report system was also developed using SAS 6 with TSO.

2.0 SYSTEM DESIGN

2.1.1 Model for Mainframe System

The PC system, which had been in place for two years, was used to track PPL service requests (estimates, non-chargeable job orders, and chargeable work orders) through different phases from inception to completion. The PC system was written in RBase System V and was designed to be menu driven and a multi-user system. The RBase PC system allowed access to the data from individual workstations and was used as a model for the external design of the TSO reports.

The major design change from the PC system was to place the selection criteria variables on the program screen which sets parameters for online or batch generated reports. (Figure 29)

The design criteria included placing the major selection criteria above the related reports, marking the reports that require a date with "(D)", placing the minor selection criteria as close to the report description as possible, prompting the user for related major and minor criteria, having the screen remember all criteria used in cases of interrupted work, using pull down lists for any known small selection criteria, and using help lists for program reports to give a brief explanation of the reports.

The basic organization of the Application Facility (AF) program includes SAS internal reports, SAS submitted reports, and TSO submitted reports. SAS internal reports and SAS submitted reports include online access to DB2 tables using SQL. (Figure 8) TSO submitted reports include online selection criteria with batch SQL. (Figure 33)

2.1.2 PC System Model

Although the PC system model is user friendly, it has disadvantages. The RBase selection is made by entering a number (Figure 1) after "Enter Your Selection :". Each selection requires additional information to be entered which is obtained from the program by prompting the user with a question. However, the fields are not remembered or shown during interrupted use, nor are they remembered for each user the next time they are used. The user must also answer four to seven questions each time a report is requested.

0. Exit	1. J.O #	
• Building	• Craft	• Summary
2. All Work Orders	8. All Work Orders	10. All Work Or
3. One Craft	9. Time Period +	11. Time Period
4. All Crafts	All Buildings	12. All Crafts
5. Time Range + Priority		13. Standing NO
6. Time Range + A Craft		14. Priority
7. Time Range + All Crafts		15. Equipment #
Enter Your Selection : 0		
 Figure 1. The Work Control Report Panel.		

2.1.3 Mainframe Enhancements to PC Model

Switching from a PC system to a mainframe system has advantages. The storage on a PC is limited to one user; the storage on the mainframe is a shared, reuseable resource. The PC retrieval time is slow for large amounts of data compared to the normal, faster operating speeds of the mainframe. Also, rather than employ a full-time person to maintain the PC system, a centralized computer systems group maintains the mainframe system over a long period of time. Finally, new systems written on the mainframe are able to interface with other mainframe data. Therefore, the PPL system was designed to interface with existing DB2 and IMS data bases.

2.1.4 Mainframe System -IMS/DC

The purpose of the IMS/DC and TSO system is to provide a Work Order and Billing System for PPL. The system interfaces with the following administrative systems: University Stores (central on hand equipment supplier), Purchasing System (off- sight tracking of equipment purchasing), Accounting System (internal cost tracking), Facility System (Building and Room information), Leave Tracking System, Payroll Employee Time and Attendance System, Human Resource Management System, and Treasurer's Office System.

2.1.4.1 Entity Relationship Model

AIS uses the Entity Relationship (ER) approach to data base design. This approach is a three phase process in which a model of a business or system is translated into a physical data base mapping.

The ER model simulates what the business (in this case the Physical Plant) is about. The Conceptual Data Model (CD) is a strategy for storing the data of a business based on the model of the business generated by the entity relationship approach. The CD addresses issues concerning where particular pieces of data will be stored.

In the following CD, "R" refers to Referential Integrity between tables and "C" refers to Cascaded change between tables.

Please note that the following tables are a subset of Figure 2: Work Order, Work Order Description, Craft \ Work Order, Craft, Employee, Employee / Work Order. These tables will be used in the SAS panels in the remainder of this paper.

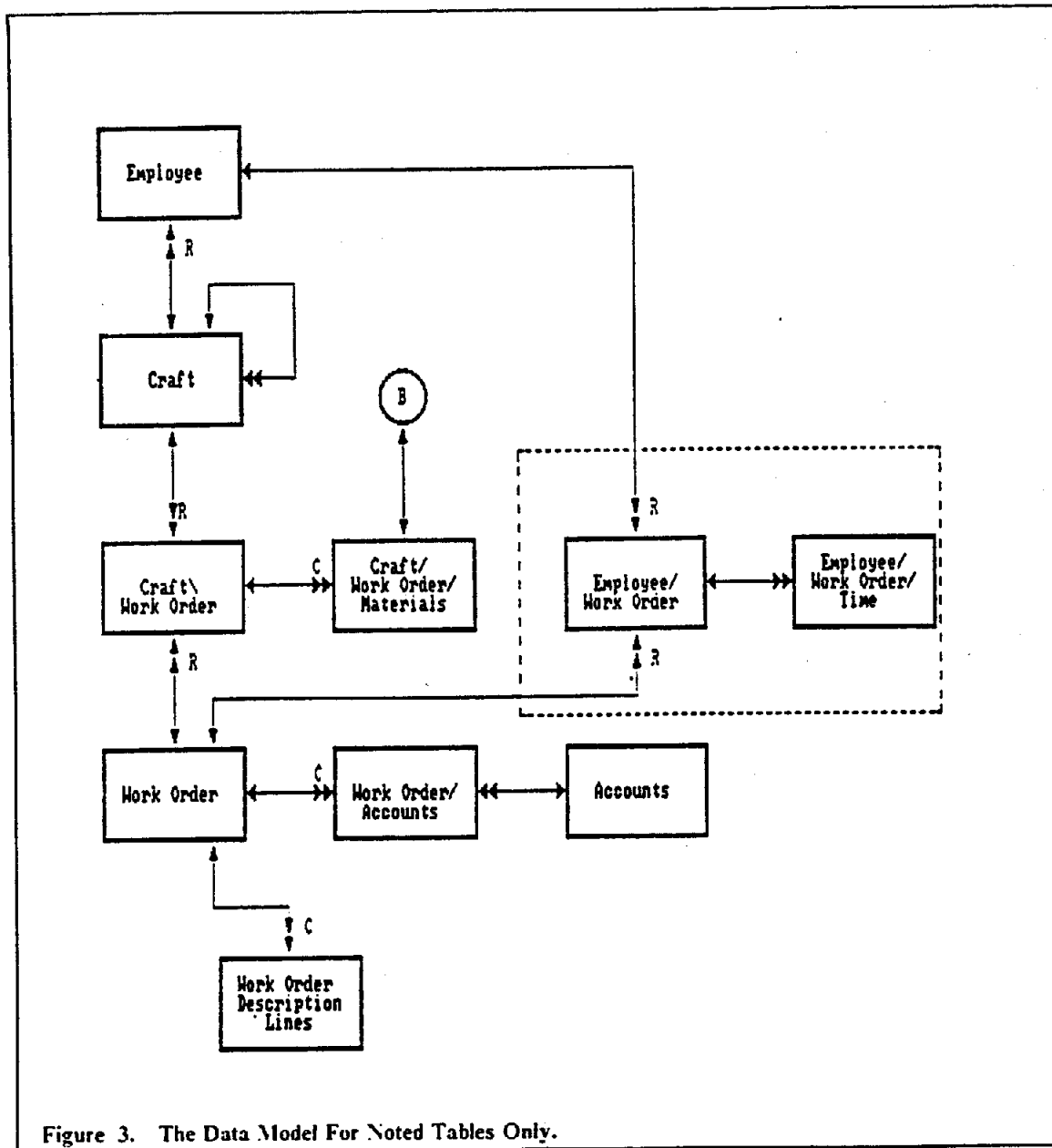


Figure 3. The Data Model For Noted Tables Only.

2.1.4.2 Edits with Existing Data Bases

Since the RBase system did not have access to existing data bases, only primitive edits were done. (Figure 1) The RBase system depended on the memory of the operator and not the correct data existing on the mainframe data bases. In addition, data entry errors were corrected during the mainframe Billing phase and rarely corrected on the RBase system.

Examples of the existing data bases maintained by other departments built for editing purposes for PPL include the following: General Ledger System (Figure 4) Facility System (Figure 5) , and Printer tables (Figure 6)

Reference to the above system menus shows the abundance of functions needed by PPL but never extensively used in the RBase system because of the changeable nature of the mainframe systems data.

General Ledger System The General Ledger System is the interface to the accounting arm of the University.

GLSMENU		GENERAL LEDGER MENU		08/21/91	
ACTION: (A/ADD,C/CHANGE,V/VIEW) CODE:					
----- INQUIRY -----					
ACTION	CODE				
V	AEI - ACCOUNTING ENTRY INQUIRY				
V	ERT - EXPLOSION RULES				
----- DATA ENTRY -----					
ACTION	CODE				
C	BCC - ACCOUNTING ENTRY BANK CODE CHANGE				
A	IAE - INITIATE ACCOUNTING ENTRY				
C	RAE - RELEASE ACCOUNTING ENTRIES				
----- OTHER MENUS -----					
PFKEY:	2 - CODE TABLE MENU	6 - FORMS MAINTENANCE			
	3 - GLS AND COA MENU	7			
	4 - FINANCIAL INQUIRY MENU -	8			
	BY ACCOUNT	9 - CHART OF ACCOUNTS			
	5 - FINANCIAL INQUIRY MENU -	10			
	BY PROJECT				
1=	2=CODEMENU	3=GLS/COA	4=ACCTINQ	5=PROJINQ	6=FORMMENU
7=	8=	9=COAMENU	10=	11=SYSTEMENU	12=LOGOFF

Figure 4. General Ledger System - Chart Of Valid Accounts

Facility System The Facility System is the interface to the Comptroller to track building and room facilities.

FACILITIES INFORMATION MENU						08/21/91	
ACTION ==>		(A/ADD, C/CHANGE, D/DELETE, V/VIEW)				CODE ==>	
FAC ABBR:	NBR:	WING:	ROOM PFX:	NBR:	SFX:	PARISH:	
ACTION	CODE	FUNCTION		ACTION	CODE	FUNCTION	
V	ABR	FACILITY SCAN		V	INT	FACILITY SCAN	
V,A,C,D	ACT	FACILITY ACTIVITY		V	RMS	ROOM SCAN	
V,A	ADR	FACILITY ADDRESS		V,A,C,D	RMI	ROOM INVENTORY	
V,A	BLG	FAC/BLDG INVENTORY		V,C	RMA	ROOM AIR HANDLER	
V,A,C,D	AMT	BUILDING INS AMOUNTS					
V,A,C,D	PRO	INS PROPERTY CODES					
PF1=LOGOFF PF2=FAC MENU PF4=FAC CODE MENU PF5=CLASSROOM MENU							

Figure 5. Facility System - Building Names, Numbers, Room Numbers

```

AISP01                                UPDATE GENERIC PRINTERS                                08/21/91
END OF DATA
System Code ==> PPL
Options (A=ADD, U=UPDATE, D=DELETE)
Printer      Default  IMS      Node      Update
Opt  Name    New Name  Form    LTERM    Name      Date:
PPLANT3      MULTIPLE P1PHY215 N1PHY215  1990-12-06
PPLANT4      SINGLE  P1PHY216 N1PHY216  1990-12-06

1 Help                                3 LSU Systems Menu                                15 LOGOFF

```

Figure 6. Printer Tables - Printer Names Used By The IMS/DC Programs

3.0 IMPLEMENTATION

Presently, AIS analysts create Job Control Language (JCL) and batch COBOL or SAS programs, then transfer the JCL to Data Processing where AIS data control personnel submit the jobs for user departments. However, Physical Plant requested user initiated reporting rather than AIS Data Control initiated reporting. Although AIS continues to maintain system and program code security, PPL now utilizes a more pliable system.

3.1.1 Menus

The organization of the TSO reports begins with the master menu. The users of the reports are either Work Control employees or PPL management employees. Both groups work hand in hand to facilitate repairs around the campus. The master menu divides the functional sets of reports into Menus and sub-menus.

By selecting option 2, the Work Order Reports menu appears with the cursor positioned on the question mark (?) of "Work Order Reports"

```
Physical Plant TSO Master Menu
Select Option ==> 2

      PHYSICAL PLANT TSO MASTER MENU

      1 - Help
      2 - Work Order Reports Menu
      3 - End (END SAS)
      4 - Work Order Statistics Menu
      5 - Accounting Menu
      6 - Preventive Maintenance Menu
      7 - Facility Search Menu
```

Figure 7. Physical Plant Master Menu

3.1.1.1 Work Order Reports

The user enters the option number and presses <enter>. Since the option requires an additional field, a prompt message will be displayed asking for the required field with the cursor positioned at the required field.

LOG

Work Order Selection Criteria

Command ==>

This option is required

1 - Help

2 - Work Order=> _____

3 - End (No report)

WO Building Abbr ==> _____

Craft ==> _

Summary

4 - All Work Orders

5 - One Craft

6 - All Crafts

7 - Time Range + Priority (D) ==> _

8 - Time Range + A Craft (D)

9 - Time Range + All Crafts (D)

10 - All Work Orders

11 - Time Period + All Buildings (D)

12 - All Work Orders

13 - Time Period(D)

14 - All Crafts(page)

15 - Priority

16 - Standing WO

Select Option ==> ?

Status ==> ACTV

Destination ==> SCREEN

(D) Enter begin date ==> 07/27/1991 and end date ==> 08/26/1991 (mmddyy)

If you need a selection list, type a ? in any field and press <ENTER>

<<Your report will list in the OUTPUT window. <PF3> until you return here!>>

09:05

Figure 8. Work Control Reports - Cursor On "Select Option = = >".

Determining Possible Reports Using DB2 Keys The key to the Work Order table is Work Order number. The tables and keys related to the Work Order (WO) table include Craft \ Work Order - craft code, WO number, and the Facility - Building Abbreviation. Using these keys, the general categories of the reports include Building reports, Craft reports, and Summary reports.

After many meetings with the user, the building and craft reports analysis showed a dependence on time and priority. Using the keys in all combinations produced the required reports.

Report Design (specific examples) The user determined that the most important feature of the reports was simplicity. Only three report formats were chosen for the fifteen possible reports: a building report, a craft report, a summary report.

The report formats contain the following variables in a table format so that the reports can be compared for content:

Building Report Variables	Craft Report Variables	Summary Report Variables
Building name	Building name	Building name
WO number	Room	Room number
WO description	WO number	WO number
Work room number	WO description	WO description
Date requested	Date requested	Date requested
Requestor name	Requestor name	Requestor name
Phone	Phone	Phone
Priority	Estimated hours	Priority
Account number	Material cost	Account number
Date completed	Priority	Estimated cost
Estimated cost	Date completed	Priority
Status.	Status.	Status.

3.1.1.2 Emulation of the old PC Environment

In the PC environment, few primitive edits or no cross edits were performed due to the DOS 640K limit on memory. To insure a dependable system, many edits are now being done. Using the mainframe insures that the report data is dependable.

3.1.2 SAS Edits

The SAS AF System allows the use of pull down menus, help screens, and the actual program logic to perform edits. Editing with pull down menus not only makes fewer calls to the DB2 tables, but is also user friendly. With the help of a "?", the user is given the possible choices for that field. Editing with help screens not only performs the same function as the pull down menus, but also offers an explanation of the option chosen. Program edits prompt the user with messages to enter required information in necessary fields. Figure 9 through Figure 12 are examples of pull down menus and program edits. An example of using the pull down menus in SAS AF is as follows:

```
LOG
Work Order Selection Criteria
Command ==>
This option is required
1 - Help                2 - Work Order=> _____ 3 - End (No report)

NO Building Abbr ==> ____ Craft ==> _ Summary

4 - All Work Orders      10 - All Work Orders      12 - All Work Orders
5 - One Craft            11 - Time Period +        13 - Time Period(D)
6 - All Crafts           All Buildings (D) 14 - All Crafts(page)
7 - Time Range + Priority (D) ==> _ 15 - Priority
8 - Time Range + A Craft (D) 16 - Standing NO
9 - Time Range + All Crafts (D)

Select Option ==> 4 Status ==> ?CTV Destination ==> SCREEN

(D) Enter begin date ==> 07/27/1991 and end date ==> 08/26/1991 (mmddyy)

If you need a selection list, type a ? in any field and press <ENTER>
<<Your report will list in the OUTPUT window. <PF3> until you return here!>>
```

Figure 9. Work Control Reports - Cursor On The "ACTV" Selection.

The user enters option 4 and tabs to the "Status" field. The user enters <?> in the status field and presses <enter>.

A pull down menu appears with the cursor positioned on the "ACTV" string. The user tabs to the "STND" field to analyze the standing Work Orders in a building and presses <enter>.

```

LOG
Work Order Selection Criteria
Command ==>

1 - Help                2 - Work Order=> _____ 3 - End (No report)

NO Building Abbr ==> ____ Craft ==> _ Summary

4 - All Work Orders      10 - All Work Orders      12 - All Work Orders
5 - One Craft            11 - Time Period +         13 - Time Period(D)
6 - All Crafts           All Buildings (D)      14 - All Crafts(page)
7 - Time Range + Priority (D) ==> _ 15 - Priority
8 - Time Range + A Craft (D)
9 - Time Range + All Crafts (D)

Select Option ==> 4 Status ==>

(D) Enter begin date ==> 07/27/1991

If you need a selection list, type a
<<Your report will list in the OUTPUT

Select A Valid Status
Command ==>

Make one selection.

ACTV - Active          991 (mmddyy)
COMP - Complete
CANC - Cancel          <ENTER>
USER - User            return here!>>
STND - Standing

09:01

```

Figure 10. Work Control Reports - Cursor On "ACTV" of pull down menu

The program prompts the user for the building abbreviation. The user enters a building abbreviation and then presses <enter>.

```

LOG
Work Order Selection Criteria
Command ==>
You have selected an option that requires the building abbreviation
1 - Help                2 - Work Order=> _____ 3 - End (No report)

NO Building Abbr ==> ____ Craft ==> _ Summary

4 - All Work Orders      10 - All Work Orders      12 - All Work Orders
5 - One Craft            11 - Time Period +         13 - Time Period(D)
6 - All Crafts           All Buildings (D)      14 - All Crafts(page)
7 - Time Range + Priority (D) ==> _ 15 - Priority
8 - Time Range + A Craft (D)
9 - Time Range + All Crafts (D)

Select Option ==> 4 Status ==> STND Destination ==> SCREEN

(D) Enter begin date ==> 07/27/1991 and end date ==> 08/26/1991 (mmddyy)

If you need a selection list, type a ? in any field and press <ENTER>
<<Your report will list in the OUTPUT window. <PF3> until you return here!>>

09:13

```

Figure 11. Work Control Reports - Cursor On The "WO Building Abbr".

The program then accesses Work Order, Work Order Account, and Work Order description tables; the AF program displays the sort screen.

```

LOG
Work Order Selection Criteria
Command ==>
You have selected an option that requires the building abbreviation
1 - Help                2 - Work Order=> _____ 3 - End (No report)

WO Building Abbr ==> tbyd   Craft ==> _           Summary

4 - All Work Orders      10 - All Work Orders      12 - All Work Orders
5 - One Craft            11 - Time Period +        13 - Time Period(D)
6 - All Crafts           All Buildings (D)      14 - All Crafts(page)
7 - Time Range + Priority (D) ==> _           15 - Priority
8 - Time Range + A Craft (D)                  16 - Standing WO
9 - Time Range + All Crafts (D)

Select Option ==> 4   Status ==> STND   Destination ==> SCREEN

(D) Enter begin date ==> 07/27/1991   and end date ==> 08/26/1991 (mmddyy)

If you need a selection list, type a ? in any field and press <ENTER>
<<Your report will list in the OUTPUT window. <PF3> until you return here!>>

```

09:13

Figure 12. Work Control Reports - Cursor On The "Craft ==>" Field.

3.1.3 Sorts

After all edits are complete, the program retrieves the information from the DB2 tables. The sort order selection screen is then displayed. The user may sort by more than one sort criteria concurrently; however, for example purposes the work order number variable is chosen.

The user places a number 1 in the Work Order Number field and presses <enter>. The data selected is then sorted by the order given.

LOG		Sort Order Selection	
Work Order Selecti		Command ==>	
Command ==>		Enter sort order numbers <ENTER> or Cancel <ENTER>	
You have selected		Sort	CANCEL command is always available
1 - Help		Order	
NO Building Abbr		Field	
		1	Work Order Number
4 - All Work Ord		-	Requested Date
5 - One Craft		-	Description
6 - All Crafts		-	Building Abbreviation
7 - Time Range +		-	Priority
8 - Time Range +		-	Estimated Cost
9 - Time Range +		PF3	to submit the selection

Select Option ==> 4 Status ==> STND Destination ==> SCREEN .

(D) Enter begin date ==> 07/27/1991 and end date ==> 08/26/1991 (mddyy)

If you need a selection list, type a ? in any field and press <ENTER>

<<Your report will list in the OUTPUT window. <PF3> until you return here!>>

09:16

Figure 13. Work Control Reports - Cursor On The "Work Order Number" Field.

The user presses <PF3> to produce the option 4 report.

LOG	Sort Order Selection	
Work Order Selecti	Command ==>	
Command ==>	Sort complete! PF3 for reports or change sort order	
You have selected	Sort	CANCEL command is
1 - Help	Order	always available
	Field	
NO Building Abbr	1	Work Order Number
	-	Requested Date
4 - All Work Ord	-	Description
5 - One Craft	-	Building Abbreviation
6 - All Crafts	-	Priority
7 - Time Range +	-	Estimated Cost
8 - Time Range +	-	
9 - Time Range +	PF3	to submit the selection

Select Option ==> 4 Status ==> STND Destination ==> SCREEN

(D) Enter begin date ==> 07/27/1991 and end date ==> 08/26/1991 (mmddyy)

If you need a selection list, type a ? in any field and press <ENTER>
 <<Your report will list in the OUTPUT window. <PF3> until you return here!>>

09:18

Figure 14. Work Control Reports - Cursor On The "Command = = = >" Field.

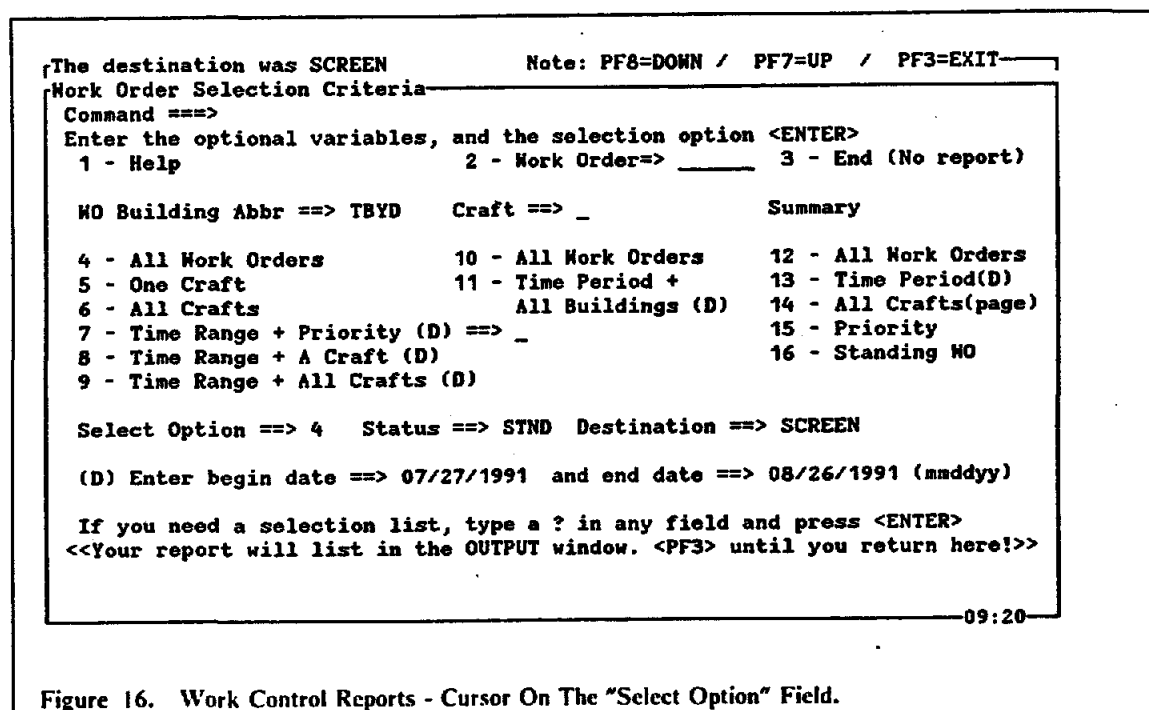
The report expected is displayed in the "OUTPUT" window. The user will have to press <PF3> until the "Work Order Selection Criteria" screen is again displayed.

The destination was SCREEN		Note: PF8=DOWN / PF7=UP / PF3=EXIT	
OUTPUT		DATA STEP suspended	
Command ==>			
NOTE: Procedure DATASSTEP created 1 page(s) of output.			
LOUISIANA STATE UNIVE			
PHYSICAL PLANT -Report Format is			
BUILDING REPORT - WORK ORD			
Building Abbreviation//Name:TBVD//THOMAS BOYD			
M.O.	WORK ORDER DESCRIPTION	ROOM	DATE REQUESTOR PH
NO		NO	RCVD NO
<----->	<----->	<----->	<----->
000001	TO CAPTURE TIME SPENT ON ANNUAL LEAVE	NA	08/14/91 TOM COOPER 89
000999	CAPTURE TIME SPENT ON ANNUAL LEAVE	NA	08/14/91 TOM COOPER 89
Total Number Of Work Orders: 2			

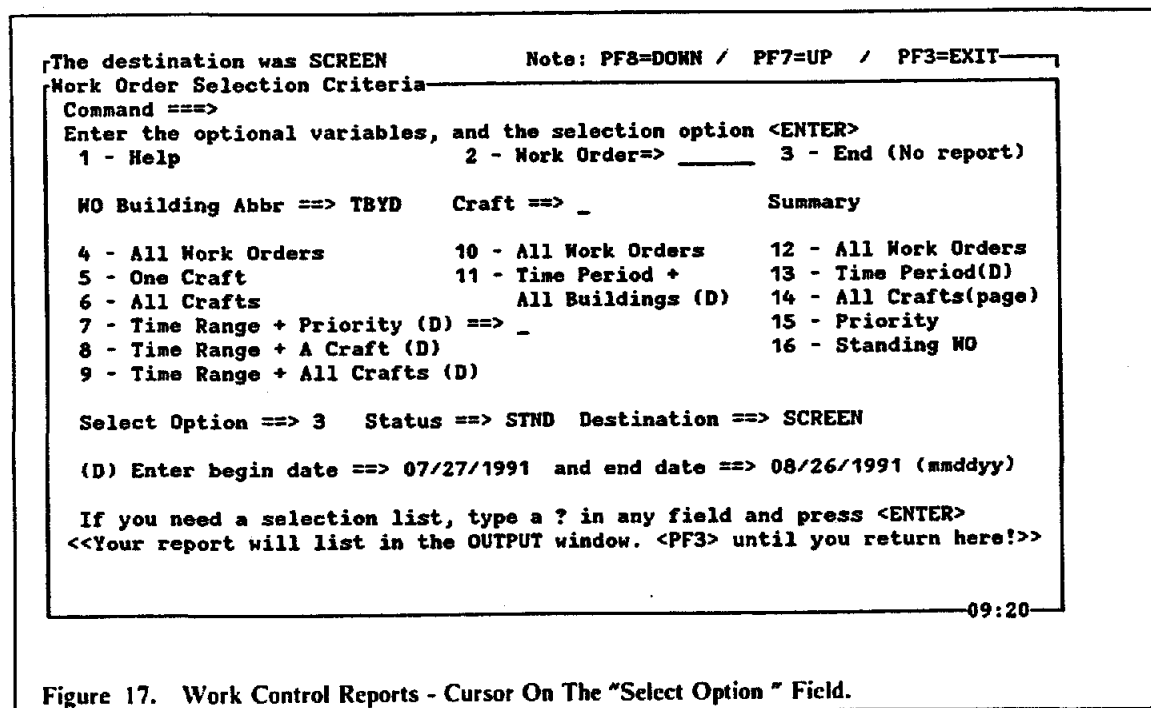
R-09:19

Figure 15. Output Window - Cursor On The "Command = = = >" Field.

The message requests another option.



The user may then choose option 3 to return to the "Master Menu".



3.1.4 Charts

The user may choose to chart various criteria. The user enters option "4" to display the Work Order Statistics Menu.

```
The destination was SCREEN          Note: PF8=DOWN / PF7=UP / PF3=EXIT
OUTPUT-----DM statement running
Physical Plant TSO Master Menu-----
Select Option ==> 4

          PHYSICAL PLANT TSO MASTER MENU

          1 - Help
          2 - Work Order Reports Menu
          3 - End (END SAS)
          4 - Work Order Statistics Menu
          5 - Accounting Menu
          6 - Preventive Maintenance Menu
          7 - Facility Search Menu

                                          09:23
```

Figure 18. Work Control Reports - Cursor On The "Select Option " Field.

The Menu program displays the statistics Work Order Selection panel designed to produce "charts" requested by PPL.

```
LOG-----PF1=Help PF3=Exit PF7=Bkwd PF8=Fwd z=Zoom-----
Work Order Selection Criteria-----
Command ==>
Enter the optional variables (oooo) ,and selection option <ENTER>
 1 - Help
 2 - Work Order Status by Priority (D)
 3 - End (No report)
 4 - Backlog status( ACTV )
 5 - Chart Buildings for a specified craft( _ ) and status
 6 - Chart A Building( _____ ) by Room for all crafts
 7 -
 8 -
 9 -

Select Option ==> 1 Destination ==> SCREEN

(D) Enter begin date ==> 07/27/1991 and end date ==> 08/26/1991 (mddyy)

If you need a selection list, type a ? in any field and press <ENTER>
<<Your report will list in the OUTPUT window. <PF3> until you return here!>

                                          09:25
```

Figure 19. Work Order Selection Criteria - Cursor At "Selection Option".

The user enters option 6, tabs to the building field where he enters "tbyd" to produce a chart showing the amount of work being done in various rooms in Thomas Boyd Hall (tbyd), and presses the <enter> key.

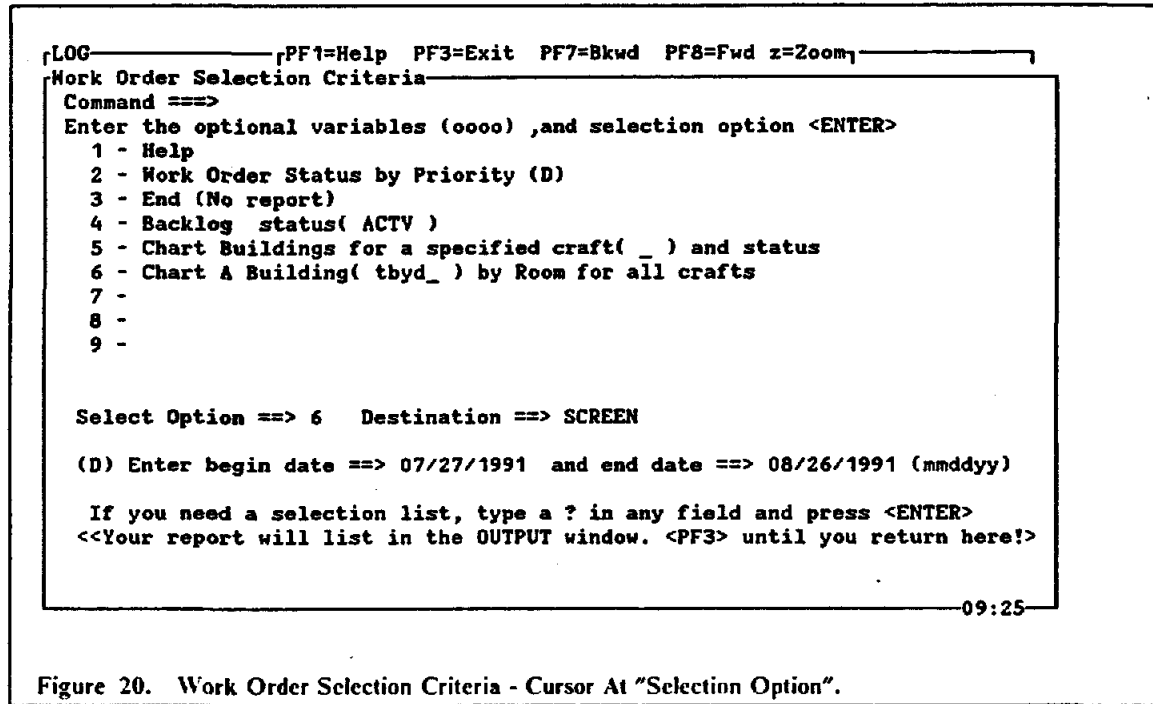


Figure 20. Work Order Selection Criteria - Cursor At "Selection Option".

Page 1 of the report displays room numbers "NA", "0100" on the vertical scale of the chart. "NA" (Not Available) and "0100" refer to room numbers where work is being done. The horizontal scale shows the frequency with the Work Order Requestor symbols, which reference the persons who requested the work. The user presses <PF3> to complete the chart on the next page.

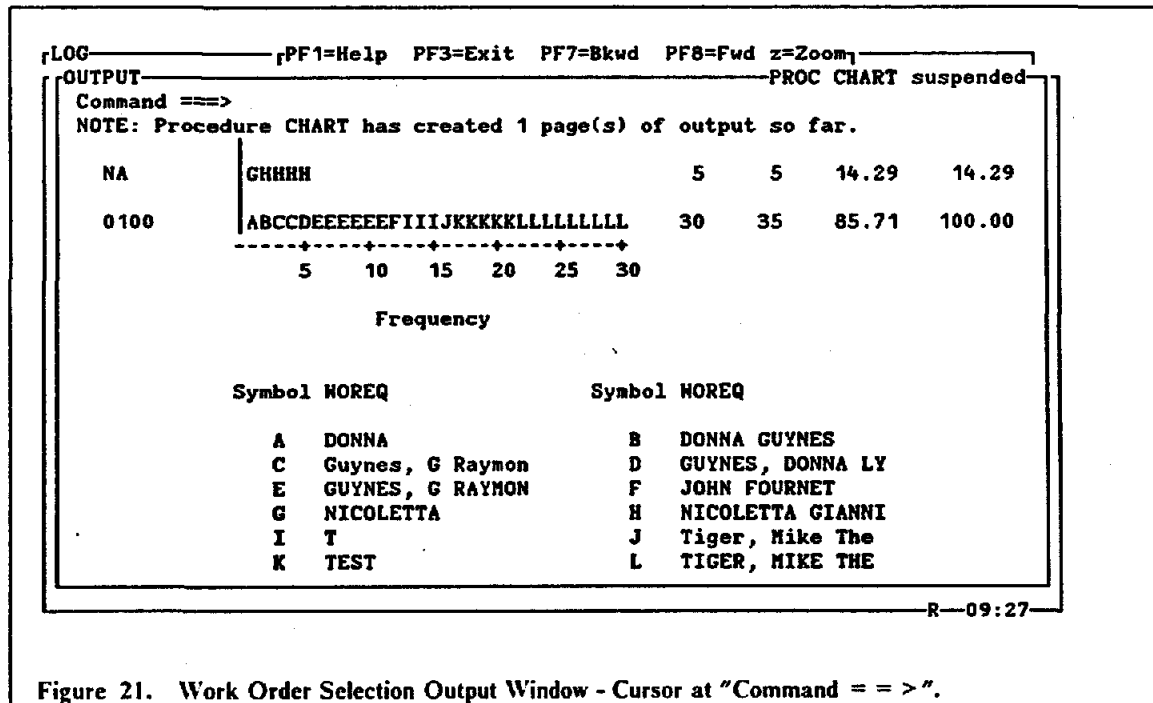


Figure 21. Work Order Selection Output Window - Cursor at "Command = = >".

```

LOG-----,PF1=Help PF3=Exit PF7=Bkwd PF8=Fwd z=Zoom-----
OUTPUT-----PROC CHART suspended-----
Command ==>
NOTE: Procedure CHART created 2 page(s) of output.
  NICOLETTA GIANNI      NNNNNNNN      4      17      11.43      48.57
  T                      000000      3      20       8.57      57.14
  Tiger, Mike The       00              1      21       2.86      60.00
  TEST                  0000000000      5      26      14.29      74.29
  TIGER, MIKE THE       000000000000000000      9      35      25.71      100.00
  -----+-----+-----+-----+
           2       4       6       8
           Frequency

           Symbol NOROMNO      Symbol NOROMNO
           N   NA              0   0100
-----R-09:30-----

```

Figure 22. Work Order Selection Output Window - Cursor at "Command == >".

Having completed the reports wanted, the user may choose option 3 to return to the "Master Menu".

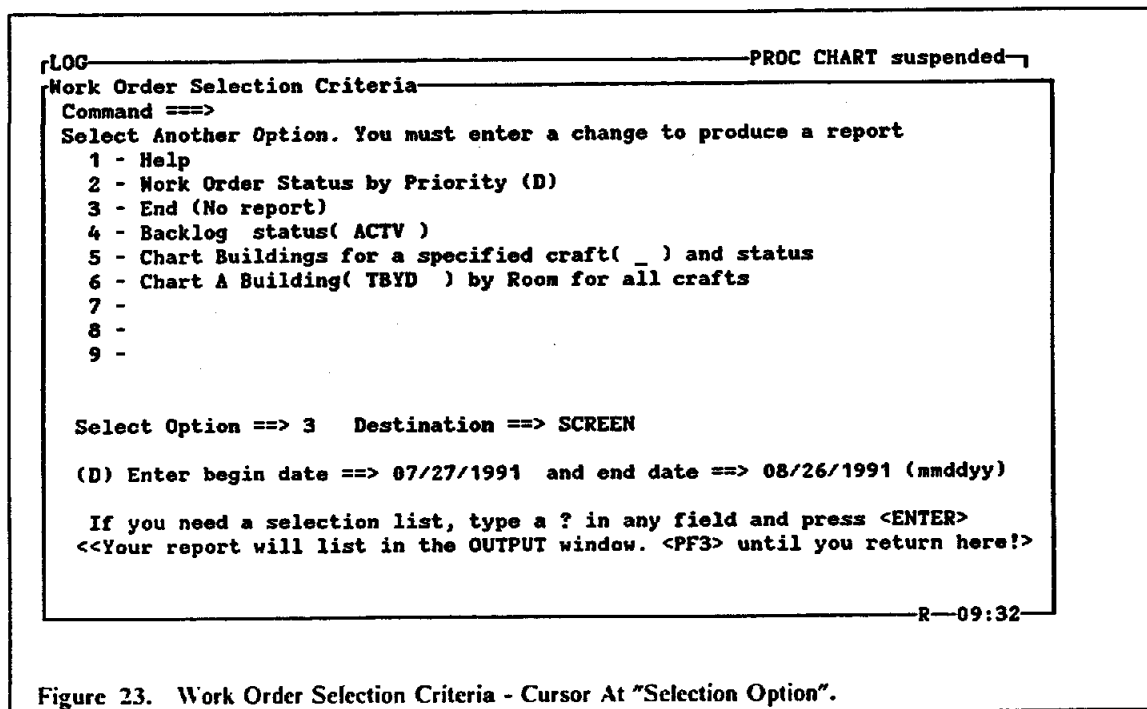


Figure 23. Work Order Selection Criteria - Cursor At "Selection Option".

The user enters "5" to display the Accounting Menu and presses <enter>.

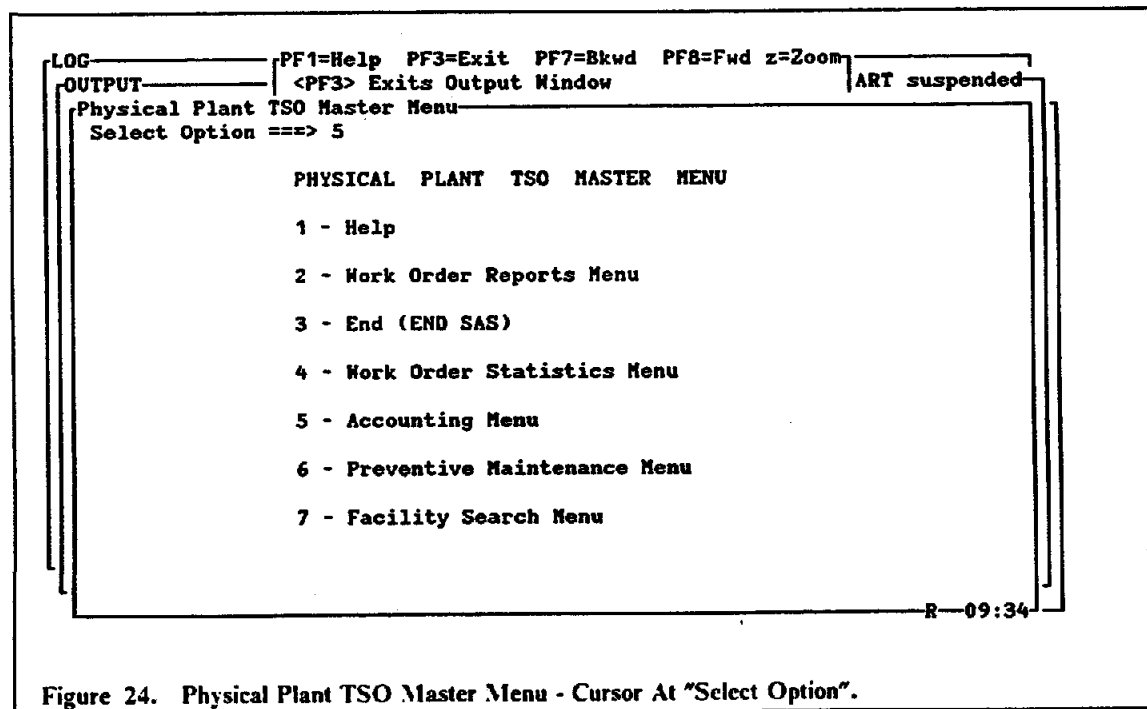


Figure 24. Physical Plant TSO Master Menu - Cursor At "Select Option".

3.1.4.1 Accounting Menu

The user enters "4" to display the Time Menu and presses <enter>.

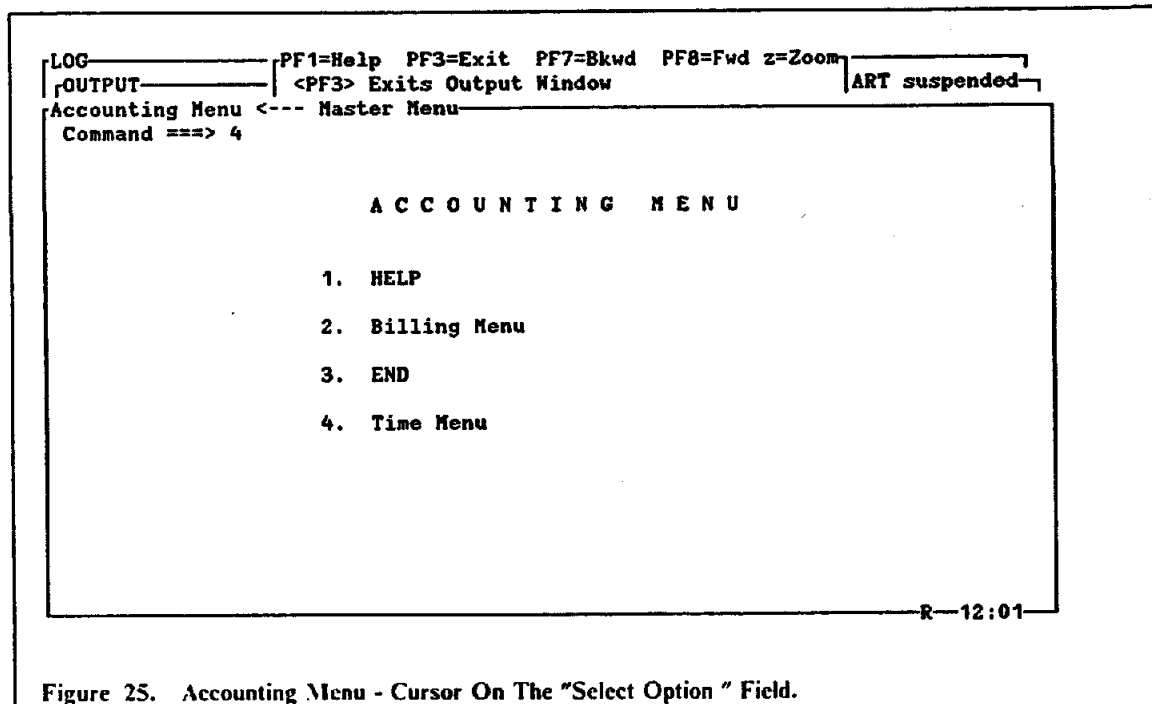


Figure 25. Accounting Menu - Cursor On The "Select Option " Field.

The user enters "2" to display the Edit Time Reports panel and presses <enter>.

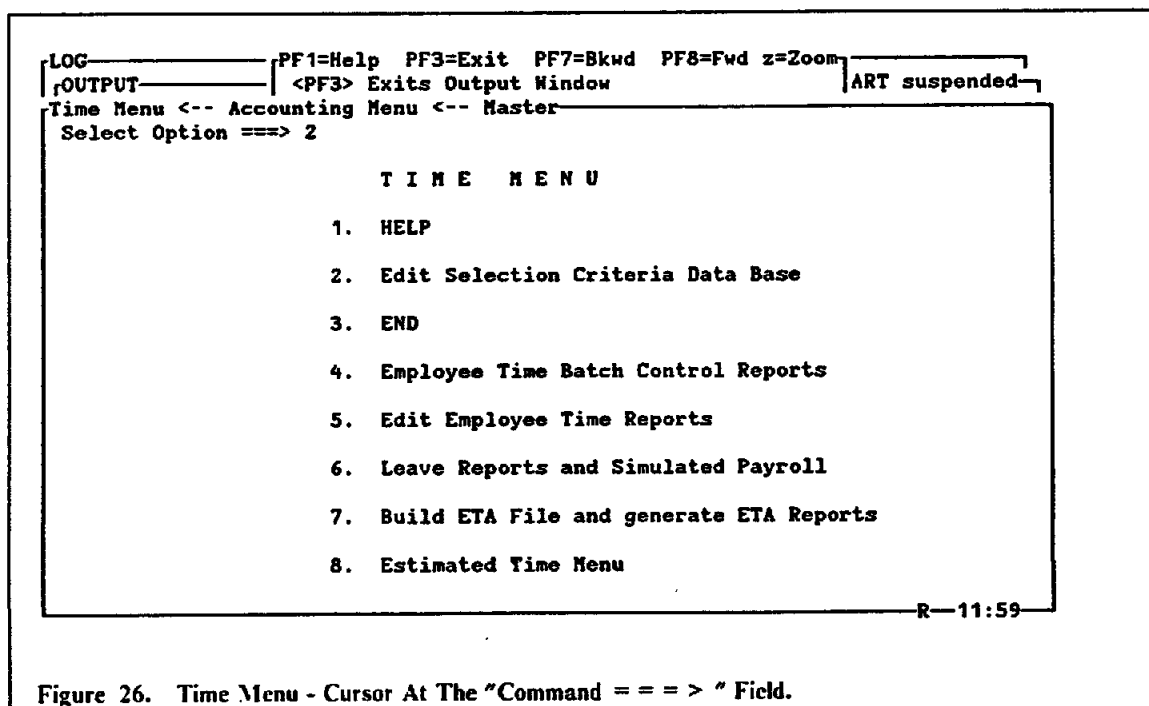


Figure 26. Time Menu - Cursor At The "Command ==> " Field.

The objective of this panel is to allow editing of the selection criteria or any other tables used in SQL joins to produce the desired edit report. See Figure 43 and Figure 44

The user tabs to option 5 and presses <enter> to highlight the selection.

LOG _____ PF1=Help PF3=Exit PF7=Bkwd PF8=Fwd z=Zoom _____

OUTPUT _____ <PF3> Exits Output Window ART suspended _____

Edit Time Reports <-- Time <-- Acct <--M _____

Command ==>

Tab the cursor to your choice and press <ENTER>

Please choose the job(s) you wish to submit

E END THIS FUNCTION BEFORE UPDATING ANY TABLES

- 1 Edit The Leave Transactions
- 2 Assign Crafts To Departments
- 3 LBOR1008 - 14 Day Payroll Period
- 4 Edit Shift Workers - 2 PASSES
- 5 Negbal, LBOR, Empdate, Service
- 6 PPL Employees Paid By Other Accts
- 7 Charageable Buildings- 2 PASSES

Press <PF3> to edit the Selection Criteria data base.

Enter the command "CANCEL" to return to the Time menu and Exit Reports.

R-10:08

Figure 27. Edit Time Reports - Cursor On The "Command == >" Field.

Option 5 is highlighted and ready to execute. The user presses <PF3> to display the Parameter Selection record.

LOG _____ PF1=Help PF3=Exit PF7=Bkwd PF8=Fwd z=Zoom _____

OUTPUT _____ <PF3> Exits Output Window ART suspended _____

Edit Time Reports <-- Time <-- Acct <--M _____

Command ==>

Tab the cursor to your choice and press <ENTER>

Please choose the job(s) you wish to submit

E END THIS FUNCTION BEFORE UPDATING ANY TABLES

- 1 Edit The Leave Transactions
- 2 Assign Crafts To Departments
- 3 LBOR1008 - 14 Day Payroll Period
- 4 Edit Shift Workers - 2 PASSES
- 5 {Negbal, LBOR, Empdate, Service}
- 6 PPL Employees Paid By Other Accts
- 7 Charageable Buildings- 2 PASSES

Press <PF3> to edit the Selection Criteria data base.

Enter the command "CANCEL" to return to the Time menu and Exit Reports.

R-10:08

Figure 28. Edit Time Reports - Cursor At Option 5.

The parameters used by labor reports to select the date that labor was entered on the IMS/DC system will be selected for Friday, July 20, 1990. The jobs that use this selection date are listed after "JOBS". The year, month, and day are unprotected and can be changed, but the weekdate format variable is protected. The user changes "90" to "91" and presses <enter>.

FSEDIT PARM.SELPARM
Obs 1 Screen 1

Command ==>

NOTE: This application uses 2 screens.

BATCH CONTROL PARAMETERS

+|LABOR SELECTION DATA -----|+

lbor1001 ----->	YEAR: 90	Fri, Jul 20, 1990
----->	MON: 7	
----->	DAY: 20	

+|----- JOBS: FREQ1, BTCHCNTL, BTCHCNT2-----|+

JOBS: All time edit reports

+|EMPLOYEE SELECTION OTCT (OVERTIME) ----- YY-MM-DD-----|+

Begin Date (Greater than) ->	OTBEGDT: 90-07-16	Mon, Jul 16, 1990
End Date --- (Less than) ---->	OTENDDT: 90-07-29	Sun, Jul 29, 1990

+|----- JOBS: REPORTOT -----|+

1 Help
3 End
11 Time Edit Criteria

R-09:45

Figure 29. FSEDIT PARM.SELPARM - Cursor On The "Command ==>" Field.

The day that work is recorded on the Temporary_EWOT DB2 table must be edited by all time edit reports. The user wants the name of the day to be displayed to insure that edits are completed before billing or payroll data is sent to the Payroll Department. If the year (YEAR), month (MON), or day (DAY) is changed, the weekdate format companion field is changed to reflect the date in the weekdate format. The user presses <PF3> after the changes are complete to return to the Edit Time Reports panel, and eventually submits one the edit reports. See Figure 35 and Figure 39

```

FSEDIT PARM.SELPARM                      Obs 1  Screen 1
Command ==>

BATCH CONTROL PARAMETERS

+|LABOR SELECTION DATA -----|+
|lbor1001 -----> YEAR:      91      Sat, Jul 20, 1991|
|-----> MON:        7|
|-----> DAY:        20|
+|----- JOBS: FREQ1, BTCHCNTL, BTCHCNT2-----|+
|----- JOBS: All time edit reports|

+|EMPLOYEE SELECTION OTCT (OVERTIME) ----- YY-MM-DD-----|+
|Begin Date (Greater than) -> OTBEGDT: 90-07-16 Mon, Jul 16, 1990|
|End Date --- (Less than) ---> OTENDDT: 90-07-29 Sun, Jul 29, 1990|
+|----- JOBS: REPORTOT -----|+

1 Help                      3 End                      11 Time Edit Criteria

R-10:12

```

Figure 30. FSEDIT PARM.SELPARM - Cursor On The "MON" Field.

Note: The day is changed from "Fri" to "Sat".

Note: "EWOT" represents Employee Work Order Time.

Option 5 is changed from highlight to normal light to show that the function has been completed. The user tabs to the "E" option and presses <enter>. The user then presses <PF3> to end the edits and to return to the Time Menu.

```

LOG_____PF1=Help PF3=Exit PF7=Bkwd PF8=Fwd z=Zoom_____
OUTPUT_____<PF3> Exits Output Window_____ART suspended_____
Edit Time Reports <-- Time <-- Acct <-- M_____
Command ==>

      Tab the cursor to your choice and press <ENTER>

Please choose the job(s) you wish to submit

E END THIS FUNCTION BEFORE UPDATING ANY TABLES

1 Edit The Leave Transactions
2 Assign Crafts To Departments
3 LBOR1008 - 14 Day Payroll Period
4 Edit Shift Workers - 2 PASSES
5 Negbal, LBOR, Empdate, Service
6 PPL Employees Paid By Other Accts
7 Charageable Buildings- 2 PASSES

Press <PF3> to edit the Selection Criteria data base.

Enter the command "CANCEL" to return to the Time menu and Exit Reports.

R-11:54

```

Figure 31. Edit Time Reports - Cursor On The "Command = = >" Field.

The user enters "5" to display the Edit Time Reports submission panel and presses <enter>.

```

LOG_____PF1=Help PF3=Exit PF7=Bkwd PF8=Fwd z=Zoom_____
OUTPUT_____<PF3> Exits Output Window_____ART suspended_____
Time Menu <-- Accounting Menu <-- Master_____
Command ==> 5

      T I M E . M E N U

1.  HELP
2.  Edit Selection Criteria Data Base
3.  END
4.  Employee Time Batch Control Reports
5.  Edit Employee Time Reports
6.  Leave Reports and Simulated Payroll
7.  Build ETA File and generate ETA Reports
8.  Estimated Time Menu

R-09:58

```

Figure 32. Time Menu - Cursor On The "Select Option" Field.

The user tabs to the option 1 field and presses <enter>. Option 1 is highlighted. The user presses <PF3> to submit the job "APPOINT1".

```

LOG_____PF1=Help PF3=Exit PF7=Bkwd PF8=Fwd z=Zoom_____
OUTPUT_____<PF3> Exits Output Window_____ART suspended_____
Edit Time Reports <-- Time <-- Acct <--M_____
Command ==>

1. Tab the cursor to your choice, 2. enter a character, 3. press <ENTER>

Please choose the job(s) you wish to submit

E End This Function Before Submitting Any Jobs

A JOB NAME - All Payroll Edits          B JOB NAME - All Accounting Ed
-----
1{APPOINT1 - Appoint. and Term. Date} 1 WOTYPE - Test NO Type For Charge
2 MINIMUM - Indirect and 8 Type NO    2 BULDESC - Bld. and Desc. Compare
3 NEGBAL1 - Annual, Sick, Comp Lve.   3 EMPTEST - Craft Compare
4 EMPCNTL - Each Employee and 8 Hrs   4 LBOR1003 - Other Department Test
5 LVEDIT - Test Each Leave Entry      5 LBOR1004 - Employee and NO Number
6 SHIFTREV - Shift Review of Workers  6 LBOR1005 - Compare NO Dates
                                         7 LBOR1006 - Compare Work Dates-TESTDT

After selecting the jobs you wish, press <PF3> to submit the job(s)
R-11:56

```

Figure 33. Edit Time Reports - Cursor On The "Command ==>" Field.

The job "APPOINT1" is submitted to the batch for execution giving the job entry system (JES) number 5395. The report produced by APPOINT1 will be held on the JES queue where the user can print the several copies required or change the DB2 data recorded for time worked. The objective of this job is to show an error if the work done is recorded before the appointment date. The user presses <enter> to complete the submission and return to the Edit Time Report.

```

JOB APPOINT1(JOB05395) SUBMITTED
***

```

Figure 34. Job Submitted Panel - Cursor On The "****" Field.

The user tabs to the "E" option and presses <enter> to highlight the end option. The user presses <PF3> to end the panel and return to the Time Menu.

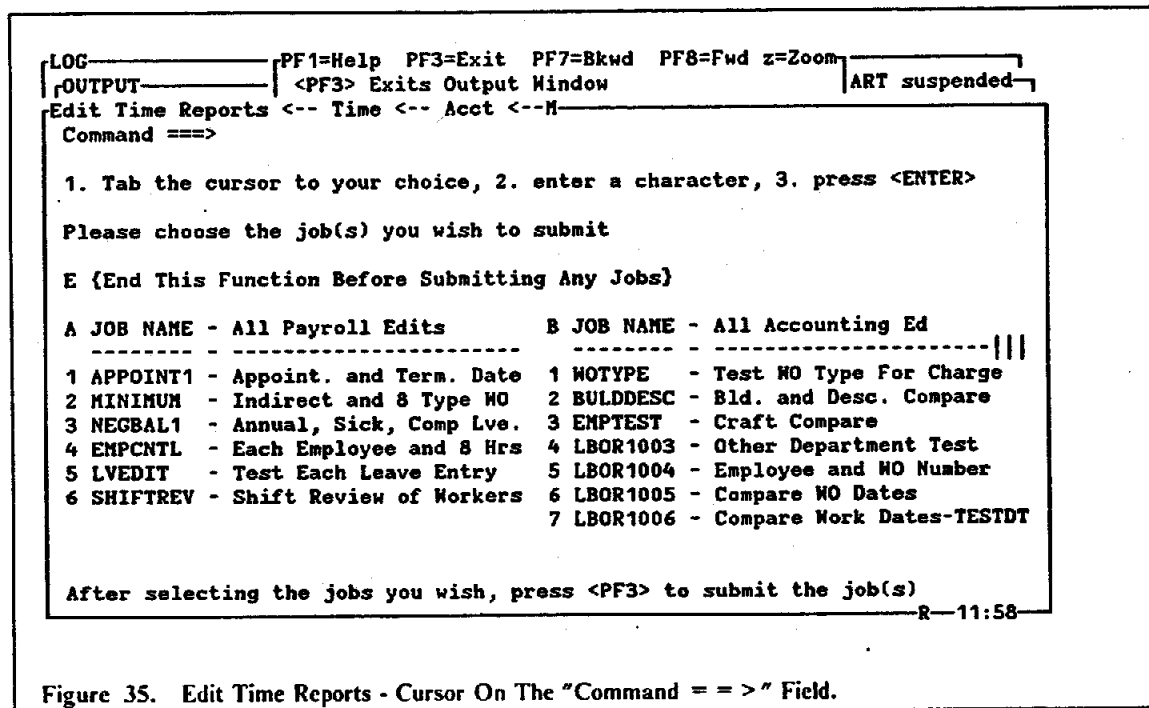


Figure 35. Edit Time Reports - Cursor On The "Command = =>" Field.

The user enters "3" to display the Accounting Menu and presses <enter>.

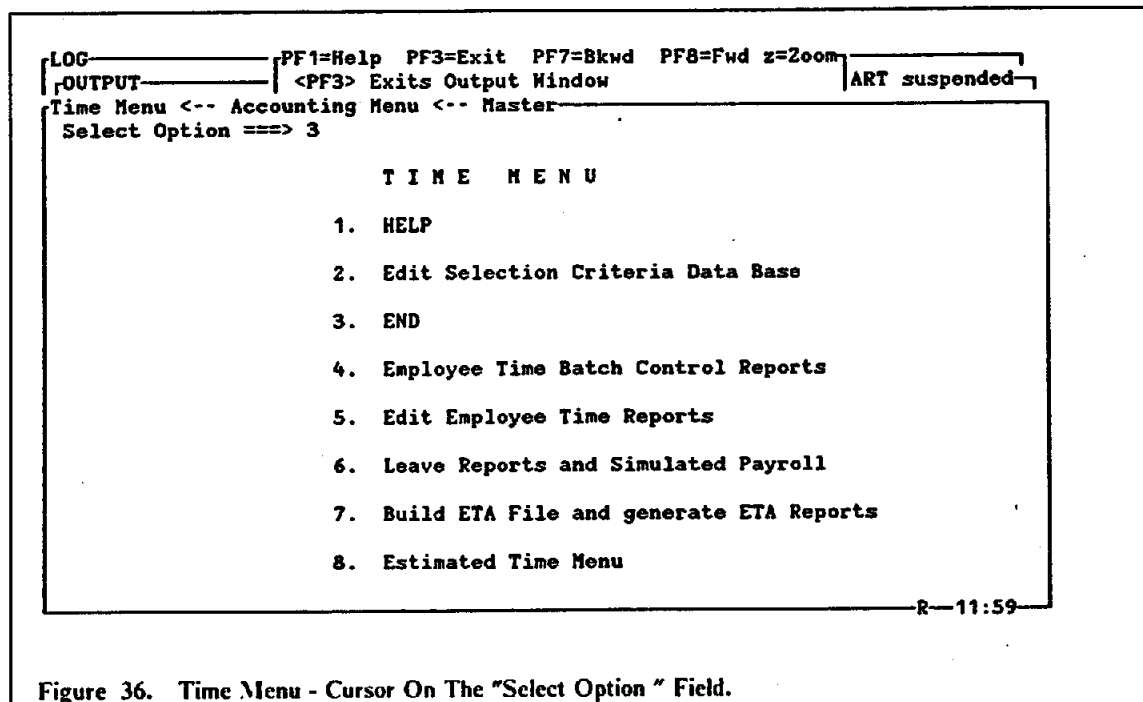


Figure 36. Time Menu - Cursor On The "Select Option " Field.

The user enters "3" to end the Accounting Menu and to return to the "Master Menu".

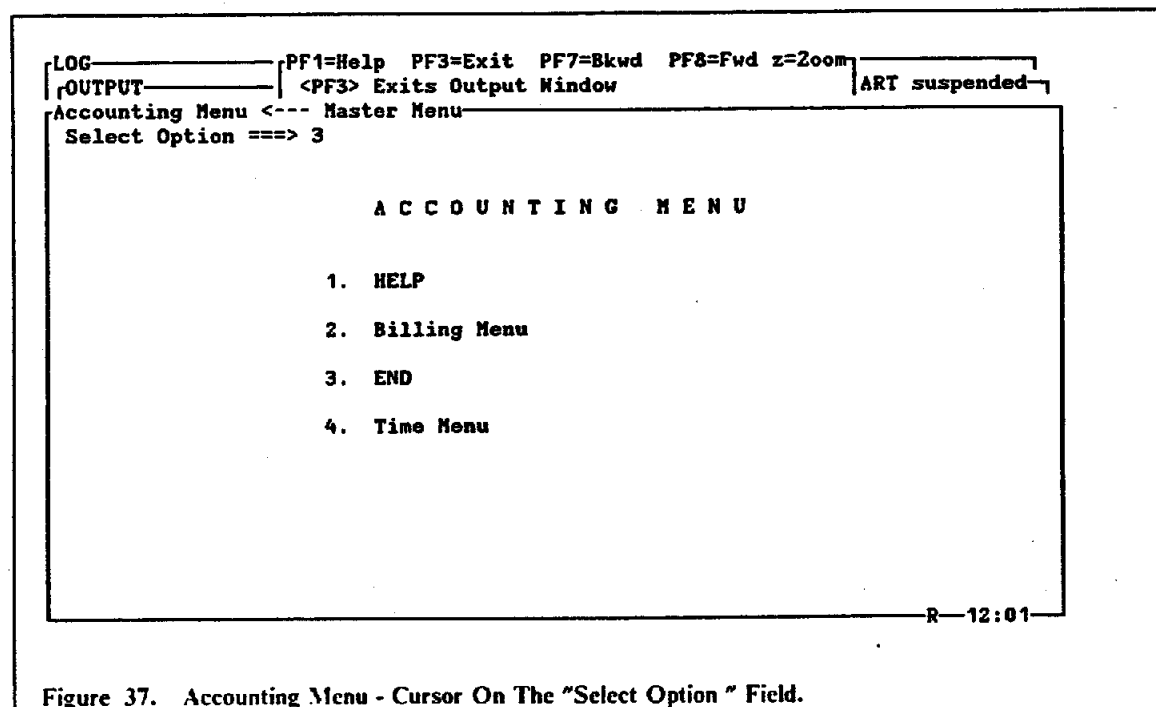


Figure 37. Accounting Menu - Cursor On The "Select Option " Field.

Having completed the report wanted, the user may choose option 3 to exit the SAS system.

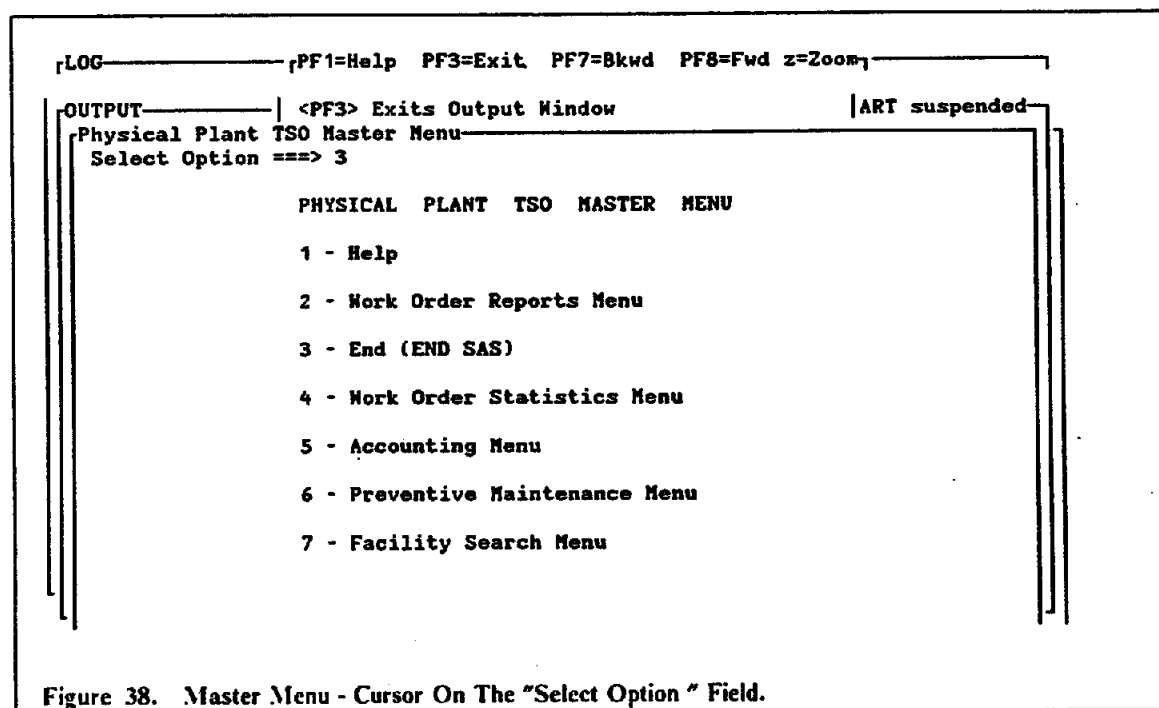


Figure 38. Master Menu - Cursor On The "Select Option " Field.

3.1.5 Internal Panel and Program Code

This panel displays the program panel used to create Figure 35 on the "EDTTMRPT" panel and pressing <enter>, the SAS code to drive the panel is displayed. After entering "source"

```
BUILD: DIRECTORY RPT.REPORTS (E)_____
Command ==>
BUILD: DISPLAY EDTTMRPT.PROGRAM (E)_____
Command ==> source

1. Tab the cursor to your choice, 2. enter a character, 3. press <ENTER>
Please choose the job(s) you wish to submit

E  SEND_____

A  SALL_PAY_____ B  SALL_ACT_____
-----
1  SA1_____ 1  SB1_____
2  SA4_____ 2  SB2_____
3  SA5_____ 3  SB3_____
4  SA8_____ 4  SB4_____
5  SA9_____ 5  SB5_____
6  SA10_____ 6  SB6_____
              7  SB7_____

After selecting the jobs you wish, press <PF3> to submit the job(s)
R-12:06
```

Figure 39. Build Program EDTTMRPT

Note: Producing the program and panel are easy to do.

The TERM portion of the program is executed after the user of the executing program presses <PF3>. The <PF8> key is pressed to page to the logic necessary to submit JCL from a read only data set.

```

BUILD: SOURCE EDTTHRPT.PROGRAM (E)-----
Command ==>

00001 INIT:
00002 RETURN;
00003
00004 MAIN:
00005 RETURN;
00006
00007 TERM:
00008 *****;
00009 *** PF3 pressed - submit the chosen jobs ***;
00010 *****;
00011     if _status_ = 'E' then
00012         do;
00013             if cancel = 'CANCEL' then
00014                 do;
00015                     _status_ = 'H';
00016                     return;
00017                 end;
00018                 _status_ = 'R';
00019             end;
00020

```

ZOOM—R—12:08

Figure 40. Build Source Program

This source shows the ease of creating a structure that allows the user to control report submission and the results without changing or viewing the JCL, IMS/BMP program or SAS program.

```

BUILD: SOURCE EDTTHRPT.PROGRAM (E)-----
Command ==>

00021     IF EDTALLPY = 'PPL72PA' then
00022         LINK allpay;
00023
00024     IF EDTALLAC = 'PPL72AA' then
00025         LINK allact;
00026
00027     if edta1 = 'PPL72A1' then
00028         call execcmdi("x submit 'AIS.USERS.SLIB(pp172a)' ");
00029
00030     if edta4 = 'PPL72A4' then
00031         call execcmdi("x submit 'AIS.USERS.SLIB(pp172d)' ");
00032
00033     if edta5 = 'PPL72A5' then
00034         call execcmdi("x submit 'AIS.USERS.SLIB(pp172e)' ");
00035
00036     if edta8 = 'PPL72A8' then
00037         call execcmdi("x submit 'AIS.USERS.SLIB(pp172n)' ");
00038
00039     if edta9 = 'PPL72A9' then
00040         call execcmdi("x submit 'AIS.USERS.SLIB(pp172p)' ");

```

ZOOM—R—12:08

Figure 41. Build Source Program

Note: BMP represents Batch Message Program.

The SAS source is continued.

```
BUILD: SOURCE EDTTMRPT.PROGRAM (E)-----
Command ==>

00061   if edtb6 = 'PPL72B6' then
00062       call execcmdi("x submit 'AIS.USERS.SLIB(pp172m)' ");
00063
00064   if edtb7 = 'PPL72B7' then
00065       call execcmdi("x submit 'AIS.USERS.SLIB(pp172u)' ");
00066
00067 *****;
00068 *** CANCEL entered - Halt the process ***;
00069 *****;
00070   if _status_ = 'C' then
00071       _status_ = 'H';
00072 RETURN;
00073
00074 ALLACT:
00075   call execcmdi("x submit 'AIS.USERS.SLIB(pp172h)' ");
00076
00077   call execcmdi("x submit 'AIS.USERS.SLIB(pp172i)' ");
00078
00079   call execcmdi("x submit 'AIS.USERS.SLIB(pp172j)' ");
00080
```

ZOOM—R—12:09

Figure 42. Build Source Program

The JCL to submit the APPOINT1 job has three data definition names (DDNAME): PPL, PARM, and SYSIN. The PPL DDNAME refers to the "access" SAS data base where the views used in the source program exist. The PARM DDNAME refers to the selection criteria in the source data set. The SYSIN DDNAME refers to the SAS source code.

```
//APPOINT1 JOB (0340,00250),'PPL TOM COOPER 107',REGION=1024K,
// MSGCLASS=S ,NOTIFY=PTCOOP
//*JOBPARM L=100,SHIFT=D
//JBSTP01 EXEC SAS606
//PPL DD DSN=PPL.PROD.ACCESS.SASDB,DISP=SHR
//PARM DD DSN=PPL.PROD.SELDATA.SASDB,DISP=SHR
//SYSIN DD DSN=SYS952.PROD.SOURCE(PPL72A),DISP=SHR *
//
```

Figure 43. JCL To Run PPL72A.

The SQL code in the example below uses the DB2 views: PPL.EMPLOYEE, PPL.DIRNAME, PPL.CRAFT, and PPL.TEMPEWOT. The SQL code in the example below uses the SAS view PARM.SELPARM. Having the ability to use SQL with DB2 and SAS allows online editing without cumbersome editing code in the SAS batch program and without creating the outmoded SAS edit report.

```
*****;
**PHYSICAL PLANT SYSTEM                               **;
**PROGRAM: PPL72A                                     **;
**DESCRIPTION: TEST APPOINTMENT AND TERMINATION DATES **;
*****;
* INPUT  : PPL.EMPLOYEE (DB2)                          ;
*          CRAFT (DB2)                                ;
*          PPL.TEMPENOT (DB2)                          ;
*          PARM.SELPARM (SAS)                          ;
*
* PROCESS: 1. JOIN TABLES                             ;
*          2. SORT BY SEQUENCE NUMBER                  ;
*          3. PRODUCE REPORT                           ;
*
* OUTPUT : COMPARISON OF TERMINATION AND APPOINTMENT DATE
*                                                GERALD 05/23/91 ;
*-----;

PROC SQL STIMER;
RESET FEEDBACK PRINT;
CREATE VIEW EMPAPT AS
  SELECT EMP.SSN,      EMP.APTDT,      EMP.TRMDT,      EMP.PPLNO,
         DIR.INDNM,    PARM.LBORDT,
         CRF.CRFGD,    CRF.CRFGDSC,
         EWOT.WONO,    EWOT.EWOTDT,    EWOT.FNGRP,      EWOT.ENTNO,
         EWOT.CRFGD,    EWOT.ACLCHPHR, EWOT.ACLOVTHR, EWOT.ACLREGHR
  FROM   PPL.EMPLOYEE AS EMP,          PPL.DIRNAME AS DIR,
         PARM.SELPARM AS PARM,
         PPL.CRAFT AS CRF,             PPL.TEMPENOT AS EWOT
 WHERE  EWOT.EWOTDT = PARM.LBORDT AND
        EMP.SSN = DIR.SSN AND
        EWOT.CRFGD = CRF.CRFGD AND
        EWOT.WONO = ' ' AND
        EWOT.PPLNO = EMP.PPLNO
 ORDER BY EWOT.ENTNO;

CREATE VIEW TEMPEMP1 AS
  SELECT EMP.SSN,      EMP.APTDT,      EMP.TRMDT,      EMP.PPLNO,
         TEMP.TMPEMPPN
  FROM   PPL.TEMPEMP AS TEMP, PPL.EMPLOYEE AS EMP
 WHERE  EMP.PPLNO = TEMP.PPLNO;

DATA EMPDATA;
SET EMPAPT;
RUN;

DATA TMPEMPD;
SET TEMPEMP1;
RUN;
```

Figure 44. SAS Source Program Used By PPL72A JCL - Page 1.

```

PROC SORT DATA=EMPDATA; BY PPLNO; RUN;
PROC SORT DATA=TMPENPD; BY PPLNO; RUN;
DATA EMP;
  MERGE TMPENPD(IN=TMPWFL) EMPDATA(IN=EMPFL);
  BY PPLNO;

  IF INDM= ' ' THEN
    INDM= TMPENPM;
  IF LBORDT LT APTDT AND TRMDT <= '01JAN60'D THEN
    DO;
      C1='<';
      C2='>';
    END;
  IF LBORDT GT TRMDT AND TRMDT <= '01JAN60'D THEN
    DO;
      C3='<';
      C4='>';
    END;
  IF EMPFL THEN
    OUTPUT;

PROC SORT;
  BY ENTNO;

PROC PRINT NOOBS;
  SUM ACLCMPHR ACLOVTHR ACLREGHR;

  VAR WONO PPLNO SSN INDM          CRFDSC C1 APTDT C2 C3 TRMDT C4
      EMDTDT
      ACLREGHR ACLCMPHR ACLOVTHR;
  FORMAT ACLCMPHR COMMA7.2;
  FORMAT ACLOVTHR COMMA7.2;
  FORMAT ACLREGHR COMMA7.2;
  FORMAT INDM      $CHAR20.;
  FORMAT CRFDSC    $CHAR15.;
  TITLE1 'LOUISIANA STATE UNIVERSITY.....PHYSICAL PLANT';
  TITLE2 'COMPARISON OF DATE WORKED WITH APPOINTMENT & TERMINATION DATE';
  TITLE4 'APPOINT1          PPL72A';

```

Figure 45. SAS Source Program Used By PPL72A JCL - Page 2.

4.0 BENEFITS

Several benefits were realized by using the SAS AF menu system for generating reports: user entered and edited online selection criteria, user generated online reports using less than 5 seconds of CPU time, user generated batch reports using greater than 5 seconds of CPU time, user pull down menus, ease of maintenance, online user documentation, and a decrease in development time.