FAST FLUX TEST FACILITY

COMPUTERIZED PREVENTIVE AND
CORRECTIVE MAINTENANCE SYSTEM
FOR FFTF FUELS DEMONSTRATION
FACILITY

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TABLE OF CONTENTS

INTRODUCTION.	1
1.0 ORGANIZATION AND RESPONSIBILITY	2
1.1 Organization.	2
1.2 Responsibility	2
1.3 Maintenance Responsibility	2
1.4 Audits.	4
2.0 PREVENTIVE MAINTENANCE SYSTEM	4
3.0 ORGANIZATION OF THE PREVENTIVE MAINTENANCE SYSTEM .	6
3.1 Master File	6
3.2 Additions to the System	9
3.3 Changing Data in the Master File	9
3.4 Special Applications	.12
4.0 OUTPUT PRODUCED BY THE SYSTEM	.16
4.1 Standard and Procedures	.18

LIST OF FIGURES

1	FFTF Fuel Fabrication Demonstration Facility. . .	2
2	RT07 Master Equipment Description	7
3	RT09 PM Specifications - PM Scheduling Information.	8
4	How to Change Records in the Master File . . .	10
5	System Changes and Deletions	11
6	FFTF - FPDF Equipment Standard	13 - 15
7	Spare Adjustment Request	17
8	PM Job Cards	19
9	Repair Card	20
10	Example of Computer Output.	22
11	BPM Numerical Coding System	23
12	PM System Flow Chart.	24

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INTRODUCTION

The Preventive Maintenance Management Plan described in this document pertains to the FFTF Fuels Department operations in the Plutonium Fuels Laboratory - 308 Building. This is one component of an overall Preventive Maintenance Program which includes other facilities at Battelle-Northwest.

1.0 ORGANIZATION AND RESPONSIBILITY

1.1 Organization

The FFTF Fuel Fabrication Demonstration Facility is one of seven major activities located in the 308 Building. The compartmented rooms and glovebox orientation provide for isolating areas from other building functions and other portions of the development line to promote safety and insure continuity of work. A layout of the FFTF portion of the 308 Building is shown in Figure 1.

1.2 Responsibility

The incumbent Assistant Department Manager, Fuel Element Development, FFTF Fuels is assigned overall responsibility for the FFTF portion of the Preventive Maintenance Program as it applies to the 308 Building.

Direction to maintenance personnel, in the form of requests for services required to support this facility is delegated to the individual manager or engineer who has the responsibility for initiating action to maintain and/or revise the preventive maintenance system to assure performance.

Responsibility for approving modifications to the facility are assigned to the responsible section manager with concurrence of the building manager.

1.3 Maintenance Responsibility

The craft foreman is responsible for performing as directed in preceding paragraphs, for coordination of maintenance activity and for compliance with the appropriate standards and approved procedures referenced in this document. He is responsible for providing quality work, controlling cost within approved budgets, and for suggesting modifications to improve quality and minimize maintenance costs.

FFTF FUEL FABRICATION DEMONSTRATION FACILITY

FIGURE 1

1.4 Audits

Audits of the P.M. system will be performed on a random schedule by FFTF Fuels Quality Assurance. Craft Services and Operations personnel will be notified prior to an audit and will receive the audit report for review and comment prior to its issuance. If other QA organizations within Battelle wish to audit the system, arrangements will be made through FFTF Fuel Quality Assurance.

2.0 PREVENTIVE MAINTENANCE SYSTEM

A computerized preventive maintenance system became operational for the Fast Flux Test Facility Process Demonstration Facility on July 1, 1969. The program was adopted to assist in the maintenance of essential¹ equipment associated with the FFTF portion of the 308 Building. The system provides the following:

- A. Automatic Scheduling produces a Preventive Maintenance (PM) job card for each piece of equipment essential to the operation, and a monthly printed schedule.

-
1. There are 32 pieces of essential equipment and four critical pieces of equipment listed for the FFTF portion of the 308 Building. (See Table 1 for listing.)

Essential Equipment - All pieces of equipment that are used on a routine basis to support the FFTF Pilot Line.

Critical Equipment - Four major pieces of equipment requiring a special standard. Operations are stopped if these pieces of equipment are not operable.

References to maintenance procedures, equipment performance standards, and check sheets are included on the Preventive Maintenance card.¹

TABLE 1

Essential Equipment

2	Vacuum Welding Hoods
1	Control Panel for Welding Hood
2	V-Blenders
2	Welders (Merrick)
6	Drying Ovens
2	Mixers Hobart
2	Ball Mills
8	Vacuum Pumps
4	Diffusion Pumps
2	Water Recirculation Pumps
1	Welder (Miller)

Critical Equipment

2	Sintering Furnaces (Brew)
2	Pellet Presses

-
1. The maintenance procedures, equipment performance standards, and check sheets are written by Craft Service and Operations personnel and mutually approved by the writers and the building manager. A copy of the procedures, standards, and check sheets is given to the Maintenance Foreman of the 308 Building; a copy is placed in the Central File located in the pilot line, and the building manager retains a copy.

- +B. Monthly backlog reports to provide information on problem areas which threaten to delay needed work.
- +C. Exception reports to tell when the actual time for a job is greater or less, within prescribed limits, than the estimated time required for the work. If several inspection periods are completed on a piece of equipment and the equipment requires no repair, the fact will be reported as an exception, and the interval between inspections may be lengthened. If repair overhauls are needed between regular inspections, exception reports will note this fact and the preventive maintenance schedule and equipment can be re-evaluated.
- D. Ready availability of information to permit prompt management action, better utilization of manpower, to conserve maintenance dollars and to improve continuity of operations.
- +E. History report, which lists the maintenance performed on all equipment the previous year.

3.0 ORGANIZATION OF THE PREVENTIVE MAINTENANCE SYSTEM

3.1 Master File

The Master File is created by filling out special input forms RT07 and RT09 for each piece of equipment in the PM Program (see Figures 2 & 3). The RT07 form is used to establish in the file a record of equipment and the RT09 form establishes the PM Scheduling Data. Data from these forms is keypunched on computer cards by Data Control (Battelle-Northwest), and sent to Computer Sciences

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- + These reports will be available to Craft Services, Operations, and FFTF Fuels QA personnel for review prior to an audit. A copy of all reports can be obtained from the Operations engineer.

Corporation (CSC) for processing. During processing, data from the punch cards are transferred to tape and retained by CSC as the Master File of the system for data process identification, code name, BPM.

3.2 Additions to the System

Additions can be made to the Master File as the need arises by providing an equipment number for each piece of equipment added to the system and completing the RT07 and RT09 input forms. The equipment numbers used in the BPM System will be assigned by Craft Services.

3.3 Changing Data in the Master File

Any entry in the Master File can be changed or deleted readily by filling in the required data on the General Input Form (Figures 4 & 5).

The General Input Forms have been prepared to indicate which spaces to fill in to accomplish a desired change. Each space to be filled in is marked by an "x". For example the equipment number will be used in every case so a number appears in each of the six spaces to be occupied. The small numbers at the top of the form represent the 80 spaces available on a keypunch card.

Each type of entry must be located precisely in the space allotted on the form. For example, if the PM class code is to be entered it must always occupy spaces (or columns) 13, 14, and 15. The column marked "field number" refers to the location of various data entries in the Master File, each of which starts in Column 46.

To obtain the field number for any desired entry, refer to the attached RT07 and RT09 forms. The forms will also show how many spaces are assigned to each field.

How to Change Records in the Master File

GENERAL INPUT FOR PM MAINTENANCE SYSTEM

Example

If either frequency
or date is changed,
both must be
entered on form.

Choose appropriate
field number
0911 through 0917

EQUIPT. NO.	HOURS EXPENDED	PM CLASS	DATE YR. MO. DA.	COMMENT CODES	TOLERANCE	FIELD		DATA	PM NUMBER
						C	NO		
1	7 8 9	12 13 14	15 16 21 22	33 34 39 40 41 44 45 46				65	69 70 75 76 80
Fxxxxxx						10703	xxxxxxx	→	
F						10708	bxxx		
Fxxxxxx						10708	b308		
F									
F									
F									
Fxxxxxx		xxx				10902	xxxxxxxxxx	→	xxxxxx
F									
Fxxxxxx		xxx				10908	xxx		
Fxxxxxx		xxx				10909	xxxxxx		
F									
F									
Fxxxxxx									
F									
F									
F									
Fxxxxxx		xxx							
F									
F									
F									
Fxxxxxx		xxx				109xx	xxx		
F									
F									
F									

Entry to be
changed

Equipment Name

Building Number

(Small "b" means,
leave space blank)

Description and/or
PI Number*

Frequency Code
Base Date

Delete all input for
this piece of
equipment

Delete all RT09
data in this class
for this equipment

Standard Hours

*In changing, description or PM number, all data must be filled in,
the changed as well as the unchanged portion.

FIGURE 4

System Changes and Deletions

GENERAL INPUT FOR PM MAINTENANCE SYSTEM

EQUIPT. NO.		HOURS EXPENDED	PM CLASS	DATE YR. MO. DA.	COMMENT CODES	TOLERANCE	T C	FIELD NO	O C	DATA	PM NUMBER
1	2	3	4	5	6	7	8	9	10	11	12
1	F XXXXX			12 13 14							
2	F										
3	F XXXXX			12 13 14							
4	F										
5	F XXXXX	0000		12 13 14	TS						
6	F										
7	F										
8	F XXXXX		XXX								
9	F										
10	F										
11	F XXXXX		XXX								
12	F										
13	F										
14	F										
15	F										
16	F										
17	F										
18	F										
19	F										
20	F										
21	F										
22	F										
23	F										
24	F										
25	F										
26	F										
27	F										
28	F										
29	F										
30	F										

Delete Job Card

Delete Rep. Card

To stop backlog
without a card

Stops job card cycle
but retains history

Class Code Change
See note below

Note: Class Code Change

1. Enter equipment no. and class code as they were originally, leave TC blank.
2. Resubmit a completed RT09 form with new class code and all entries for this class.

FIGURE 5

The Transaction Code (TC) in Column 40 tells the computer how to handle the entry. The TC to use for various input changes is also shown on the preceding General Input Forms.

The General Input Forms shown here are sized for typewriter use. If it is desirable to fill them in by hand a regular 80-80 Fortran sheet can be used, Form No. 54-3000-563 (9-66). All forms may be obtained from Craft Services.

All input to the system is sent to Data Control on a monthly basis on the first working day each month.

3.4 Special Applications

Pieces of equipment that are critical to the operation have a special maintenance standard. An example of an equipment maintenance standard appears in Figure 6. All process control items such as pressure gages, temperature recorders, controllers, are calibrated periodically and tagged to indicate when last inspected.

Inspection and test items are on a recall program (FFTF Fuel Department Program for Calibration and Control of Measuring and Test Equipment and Standards, Quality Assurance Manual A-0108). Each item is calibrated with standards traceable to the National Bureau of Standards. The period of inspection varies with the use of the item. The dates of inspection for each item are recorded in a master log book centrally located in the pilot line. Each balance in the recall program has its own set of weights. The weights are numbered and used only with one particular balance. Operations personnel periodically field calibrate the inspection and test equipment to make sure it is in proper adjustment.

A spare parts inventory is a vital part of the PM system. Initially an ITT Federal Support Services, Inc. Spares

BATTELLE-NORTHWEST FFTF-FPDF EQUIPMENT STANDARD		STANDARD NO. SCP-1 ISSUE DATED PREPARED BY (CS 7164) DATE	PAGE 1 OF 3 REVISION DATE
ISSUED BY (CS 7164) <i>[Signature]</i>	DATE 6-25-69	APPROVED BY (MGR FFTF-FPDF) <i>[Signature: R.E. Bardsley]</i>	DATE 6/26/69
TITLE Powder Compacting Press; Western Sintering Co., Inc., Model H-10-2		SYSTEM Fuel Preparation	

I. DESCRIPTION

The powder compacting press is designed and installed for use within a glove box with the hydraulic pressure unit installed outside the glove box. Pressure lines penetrate the glove box wall to supply pressure to the hydraulic cylinders. The press is designed for manual or automatic operation. Final compaction may be accomplished by either limit switch or pressure switch action as selected by the mode selector switch. Two presses are in service.

II. REFERENCE

Hydraulic Powder Compacting Press Operating Manual.

III. SPECIAL TEST EQUIPMENT

Heise Gauge test unit, 0-3000 psi, accuracy checked within six months.
 Ohm meter or a continuity indicating device.
 Portable cycle timer.

Assure that the calibration date has not expired on all standards or test devices before using.

IV. STANDARD REQUIREMENT

- A. Scheduled by PM No. AM050C or AM051C.
- B. Complete FFTF Equipment Standard Record Sheet.
- C. Helicoil 0-500, 0-3000 psi pressure gauges and Mercoid 0-300, 0-2500 psi pressure switches shall be accurate to ± 1 increment of scale.
- D. Press dwell timer shall be accurate to ± 1 increment of scale.
- E. The hydraulic pump emergency stop switch shall be capable of de-energizing the hydraulic pump motor.

V. STANDARD PROCEDURE

- A. Authorization shall be obtained from operating group for maintenance.
- B. To test pressure gauges and switches, it will be necessary to de-energize the hydraulic unit and remove pressure from lines.
 1. Open line at pressure gauge or switch to be tested and connect Heise gauge test unit.
 - a. Care must be taken to bleed system of any air that enters the system when lines are opened.

TITLE	STANDARD NO.	PAGE
Powder Compacting Press, Western Sintering Co., Inc., Model H-10-2	SCP-1	2 OF 3

2. Test 0-500 psi pressure gauge at 100 psi increments; test 0-3000 pressure gauge at 500 psi increments.
3. When testing pressure switches, connect ohm meter to switch contact and test 0-300 psi switch (PS-2) at 100 psi increments; test 0-2500 psi switch (PS-1) at 500 psi increments.
4. Assure that all opened lines are properly reconnected.
5. Connect portable cycle timer to dwell timer as shown; energize hydraulic unit and operate press in the pressure mode at normal dwell time, and test accuracy of dwell timer. Three tests required.
6. With hydraulic pump running, actuate the emergency stop button and assure that the hydraulic pump motor is de-energized.

C. Assure there are no leaks at connections opened for testing; return equipment to normal service.

1. Assure that system is properly bled.

FIGURE 6 (contd)

TITLE Powder Compacting Press Western Sintering Company, Inc., Model H-10-2	STANDARD NO. SCP-1	PAGE 3 of 3
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FFTF EQUIPMENT STANDARD RECORD SHEET

Helicoid 0-500 psi gauge:

<u>Test at:</u>	<u>Accuracy</u>
100 psi	_____
200 psi	_____
300 psi	_____
400 psi	_____
500 psi	_____

Helicoid 0-3000 psi gauge:

<u>Test at:</u>	<u>Accuracy</u>
500 psi	_____
1000 psi	_____
1500 psi	_____
2000 psi	_____
2500 psi	_____
3000 psi	_____

Mercooid 0-300 psi switch:

<u>Test at:</u>	<u>Accuracy</u>
100 psi	_____
200 psi	_____
300 psi	_____

Mercooid 0-2500 psi switch:

<u>Test at:</u>	<u>Accuracy</u>
500 psi	_____
1000 psi	_____
1500 psi	_____
2000 psi	_____
2500 psi	_____

Dwell Timer:

<u>Test at:</u>	<u>Accuracy</u>
0.2 Second	_____
0.5 Second	_____
0.8 Second	_____
1 Second	_____
2 Seconds	_____
3 Seconds	_____
5 Seconds	_____

Emergency stop button is capable of de-energizing hydraulic pump motor when
 actuated? _____ yes _____ no

Equipment has been returned to normal service?
 _____ yes _____ no

Performed by _____

Describe repairs or other maintenance performed on this equipment: _____

FIGURE 6 (contd)

Adjustment Request Form (#54-3000-166) is filled out by the Craft Services maintenance foreman and approved by the responsible section engineer. After the spare parts inventory has been established adjustments and corrections can be made as the need arises. The ITT SAR form is included as Figure 7.

4.0 OUTPUT PRODUCED BY THE SYSTEM

All of the output is produced on a monthly request basis. The request form together with the job cards and system changes data, is submitted to Data Control the first working day each month.

The output normally requested each month is as follows:

- A. PM job cards and job card listing for the following month.
- B. Backlog report on jobs not completed the previous month.
- C. Exception reports indicating:
 - 1. When the estimated job time is 50% more or 50% less than the actual job time.
 - 2. Equipment which required no maintenance for several intervals.
 - 3. Repairs which were required between intervals.
- D. Complete PM listings for all equipment. One listing by PM number and one listing by "F" number.¹

Additional output available:

- E. Advance Schedule Report, lists jobs scheduled each month from one to twelve months in advance.

1. The "F" number is the number identifying a piece of equipment.

FIGURE 7

SPARE PARTS
SPARE EQUIPMENT HELD IN STORAGE
(SEE REVERSE SIDE FOR INSTRUCTIONS)

DISTRIBUTION: - SEE REVERSE SIDE
COPY 2.
RETURN TO:

TO:
MANAGER, INVENTORY CONTROL
1166 BUILDING, 1100 AREA
ITT/FSS

PAGE _____ OF _____
SUPPLEMENT NO. _____

CHECK APPROPRIATE
SQUARES AND INSERT
APPROPRIATE NUMBER
IN ACTION SYMBOL
COLUMN:

1. ☐ ADD THE FOLLOWING NEW PARTS
2. ☐ DELETE THE FOLLOWING PARTS
3. ☐ ALTER PRESENT MAX. AND MIN.
4. ☐ OTHER (EXPLAIN)

5. ☐ EQUIPMENT DESCRIPTION
6. ☐ PARTS DESCRIPTION
7. ☐ ADDITIONAL INFORMATION

8. ☐ BACK UP FOR COST, PROC. CONST. SPARE
9. ☐ BACK UP FOR CONST. PROC. OPERATION SPARE
10. ☐ ADD THE FOLLOWING MATERIAL ON PLANT SITE
11. ☐ CHANGE MAX. TO ZERO. DO NOT EXCESS STOCK ON HAND

COMPLETE THIS SECTION IN ITS ENTIRETY

EQUIPMENT NO. _____
B.P.F. _____

SIZE _____
VOLT. _____

ADDITIONAL EQUIPMENT INFORMATION:

MFG. _____
TYPE _____
MODEL _____
DWG. NO. _____
SERIAL NO. _____

VENDOR (IF OTHER THAN MFG.) _____
PREVIOUS PURCHASE ORDER NO. _____
SPECIAL HANDLING OR STORAGE (BE SPECIFIC) _____

ITEM NO. _____
ACT. QTY. _____
SYM. REQ. QTY. _____
ORDERED QTY. _____
LIST IN CONTINUOUS FORM (NOT COLUMNAR) AS FOLLOWS: 1ST MAIN NOUN, 2ND DESC. INFO., 3RD PART NO., 4TH MFG. NAME IF OTHER THAN SHOWN FOR THE EQUIPMENT.

PARTS DESCRIPTION FOR ABOVE EQUIPMENT
UNIT _____
MAX. _____
MIN. _____
LEAD TIME _____
CDDE _____

IF MATERIAL IS TO BE PURCHASED ON A NO SUB BASIS
☐ CHECK BLOCK AND GIVE REASON WHY THIS IS NECESSARY:
REQUEST ISSUED BY _____
PHONE _____
AUTHORIZED BY _____
DATE: _____
STORES APPROVAL _____
DATE: _____
COST APPROVAL _____
INSPECTION REQ'D. ☐

BLDG. _____
CONTRACTOR: _____
DATE: _____

F. History report, a listing of maintenance performed on all equipment, the previous year.

The following pages contain a brief discussion of how the automated system will be handled by maintenance personnel and an explanation of codes used in the system.

The system operates on a monthly cycle producing job cards for each PM scheduled the following month. The cards will be received about three weeks in advance and turned over to scheduling with the appropriate check lists and standards. The maintenance foreman is required to advise the operating personnel of anticipated down time as a basis for mutual scheduling.

4.1 Standard and Procedures

All standards and test equipment used in the field for calibration are calibrated by the Standards Laboratory with equipment traceable to the National Bureau of Standards. The field test instruments will be tagged to show the calibration date and the calibration expiration date.

Each piece of equipment to receive maintenance will relate to a checklist or written standard which will be followed during the preventive maintenance. These standards or checklists will reference the specification found in the owner's manual or the National Bureau of Standards to insure that the equipment is properly checked. A central file, located in the pilot line, will contain all equipment manuals and will be at the disposal of the craftsman at all times.

Craftsman fills in this side			
DATE	SCHEDULED WORK	INSPECTOR'S REPORT	INSPECTED BY
1. Indicate any abnormal (as found) condition of equipment. Such as, out of calibration or adjustment, noisy, leaking, overheating, damage, etc.			
2. Report work done, adjustments, calibrations, repairs, replacements, etc.			

PM NO.	EQUIPT. NAME	PM CLASS (COL. 13-15)	EQUIPT. DESCRIPTION	BLOG.
469	VALVES, CD6&6A	B2F00	DURING ANNUAL CVLRT	309
SCHED. DATE	15			
<div style="display: flex; justify-content: space-between;"> Frequency 82647 EQUIPT. NO. (COL. 1-7) F263385 </div>				
PM JOB CARD				
<div style="display: flex; justify-content: space-between;"> Foreman fills in time to nearest 0.1 HOURS EXPENDED (COL. 9-12) </div>				
<div style="display: flex; justify-content: space-between;"> Use all spaces DATE </div>				
<div style="display: flex; justify-content: space-between;"> Filled in by PM, Office MO. DAY YR </div>				
<div style="display: flex; justify-content: space-between;"> COMMENTS CODES (ALPHA 22-38) TOLERANCE (NUMERIC 34-39) </div>				
<div style="display: flex; justify-content: space-between;"> TC </div>				
<div style="display: flex; justify-content: space-between;"> (COL. 40) </div>				

BD-5100-158 (9-67)

FIGURE 8. PM Job Cards

REPAIR CARD

EQUIPT. NO. (COL. 1-7)	F		REPAIR HOURS (COL. 9-12)	.
		R E P		18, 19 20, 21 16, 17
		13 14 18	DATE	/ /
				MO. DAY YR
COMMENT CODES (ALPHA-22-33)				
TOLERANCE (NUMERIC-34-39)	.	T.C. 3 (COL. 40)	CODE CRAFT (A/N-COL. 45)	
BLDG. LOC. _____			PM NO. _____	

BD-5100-157

Repair cards are used to record data on unscheduled maintenance. The cards should be filled out similar to the job cards with the following additions:

1. The equipment number in this system is the six digit number preceded by the letter F. Obtain this number from listings available in the PM office.
2. Fill in the space marked code craft. This is the same letter used in all the codes to designate the craft foreman.

A -- Electrical
B -- Instruments
C -- Mechanical

DATE	SCHEDULED WORK	INSPECTOR'S REPORT	INSPECTED BY

FIGURE 9. Repair Card

The following pages contain an example of the computer output sheets, the coding system used for the PM System and the PM System flow chart.

These sheets are self-explanatory and are placed in this report as an aid to understanding the Preventive Maintenance System.

PM Number	Equip. No.	Name	Bldg.	Class Code	Freq. Code	Base Date	Expense Code	Estimated Hours						
								E	I	M	F	R	E	O
AA039J	F025043	MCC #1	39-1LL	308	L A3J	19J	121568	41308	8	0	0	0	0	0
AA039J	F025045	MCC #2	39-2LL	308	L A3J	19J	121568	41308	8	0	0	0	0	0
AA039J	F025047	MCC #3	39-3LL	308	L A3J	19J	121568	41308	8	0	0	0	0	0
AA039J	F025048	MCC #4	39-4LL	308	L A3J	19J	121568	41308	8	0	0	0	0	0
AA039J	F025051	MCC #5	39-5LL	308	L A3J	19J	121568	41308	8	0	0	0	0	0
AA039J	F025052	MCC #6	39-6LL	308	L A3J	19J	121568	41308	8	0	0	0	0	0
AA039J	F025054	MCC #7	39-7LL	308	L A3J	19J	121568	41308	8	0	0	0	0	0
AA039J	F025055	MCC #8	39-8LL	308	L A3J	19J	121568	41308	8	0	0	0	0	0
AA039J	F025056	MCC #9	39-9LL	308	L A3J	19J	121568	41308	8	0	0	0	0	0
AA039J	F025060	MCC #10	39-10LL	308	L A3J	19J	121568	41308	8	0	0	0	0	0
AA039J	F025062	MCC #11	39-11LL	308	L A3J	19J	121568	41308	8	0	0	0	0	0
AA039J	F137343	TRANSFORMERS	39-26LL	308	L A3J	19J	121568	41308	39	0	0	0	0	0
AA039J	F264806	SWITCHGEAR MAIN	39LL	308	L A3J	19J	121568	41308	24	0	0	0	0	0
AA039J	F264807	MCC #13	39-12LL	308	L A3J	19J	121568	41308	8	0	0	0	0	0
AA039J	F264808	BREAKER	39-13LL	308	L A3J	28J	121568	41308	8	0	0	0	0	0
AA039J	F264808	BREAKER	39-13LL	308	L B3J	26J	121568	41308	1	0	0	0	0	0
AA039J	F264809	BREAKER	39-14LL	308	L A3J	28J	121568	41308	8	0	0	0	0	0
AA039J	F264809	BREAKER	39-14LL	308	L B3J	26J	121568	41308	1	0	0	0	0	0
AA039J	F264810	BREAKER	39-15LL	308	L A3J	28J	121568	41308	8	0	0	0	0	0
AA039J	F264810	BREAKER	39-15LL	308	L B3J	26J	121568	41308	1	0	0	0	0	0
AA039J	F264811	BREAKER	39-16LL	308	L A3J	28J	121568	41308	8	0	0	0	0	0
AA039J	F264811	BREAKER	39-16LL	308	L B3J	26J	121568	41308	1	0	0	0	0	0
AA039J	F264812	BREAKER	39-17LL	308	L A3J	28J	121568	41308	8	0	0	0	0	0
AA039J	F264812	BREAKER	39-17LL	308	L B3J	26J	121568	41308	1	0	0	0	0	0
AA039J	F264813	BREAKER	39-18LL	308	L A3J	28J	121568	41308	8	0	0	0	0	0
AA039J	F264813	BREAKER	39-18LL	308	L B3J	26J	121568	41308	1	0	0	0	0	0
AA039J	F264814	BREAKER	39-19LL	308	L A3J	28J	121568	41308	8	0	0	0	0	0
AA039J	F264814	BREAKER	39-19LL	308	L B3J	26J	121568	41308	1	0	0	0	0	0
AA039J	F264815	BREAKER	39-20LL	308	L A3J	28J	121568	41308	8	0	0	0	0	0
AA039J	F264815	BREAKER	39-20LL	308	L B3J	26J	121568	41308	1	0	0	0	0	0
AA039J	F264816	BREAKER	39-21LL	308	L A3J	28J	121568	41308	8	0	0	0	0	0
AA039J	F264816	BREAKER	39-21LL	308	L B3J	26J	121568	41308	1	0	0	0	0	0
AA039J	F264817	BREAKER	39-22LL	308	L A3J	28J	121568	41308	8	0	0	0	0	0
AA039J	F264817	BREAKER	39-22LL	308	L B3J	26J	121568	41308	1	0	0	0	0	0
AA039J	F264818	BUS DUCT	39-23LL	308	L A3J	19J	121568	41308	100	0	0	0	0	0
AA039J	F264819	PANEL P+L 13	39-25LL	308	L A3J	19J	121568	41308	39	0	0	0	0	0

FIGURE 10. Example of Computer Output

FIGURE 11. BPM Numerical Coding System

PM SYSTEM FLOW CHART

24

FIGURE 12

BNWL-1213

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