Course Outline (4 Day)

TRAINING MATERIALS:

BPS M5 Course Outline for distribution
BPS M5 Training Manual
BPS M5 Technical Diagrams
BPS M5 Service DVD
Laptop with Windows XP or Windows 7/10 with VMWare Player 12
USB to Serial Convertor
Hyper terminal or serial emulation program
USB stick (32GB preferable)

I. LESSON: Day 1

II. TOPICS: Documentation overview, Safety, Administrator Access throughout the system, Machine PC, and Software Installation

III. TRAINING OBJECTIVES:

Upon completion of this day of the course, the successful student should be able to:

- Identify with the supporting documentation and supplemental training available for the BPS M5 product.
- Identify safety issues when operating and servicing the BPS M5.
- Use optional and external equipment available for the BPS M5.
- Explain the BPS M5 Processing Operation procedures.
- Explain the different modes of Large Capacity Feeder (LCF) processing operations.
- Identify User, Supervisor, and Service access rights including menu options for each role.
- Explain the electronic components of the BPS M5 product.
- Identify the hardware makeup in the Basis Module.
- Identify the functional components that comprise the MPC.
- Explain how to configure, modify, and operate the System BIOS setup

IV. INSTRUCTIONAL TASKS:

A. Review the outline for the BPS M5 Training Program

B. Identify the overall course goal, and the general course objectives.

C. Distribute the Training Manual and Technical Diagrams.

D. Distribute BPS M5 DVD.

E. Identify the main sections in the Customer Documents:

1. Operating Manual
2. Site and Facility Requirements
3. NotaScan2 Sensors

F. Identify the main sections in the Service Documents:
1. Maintenance Manual
2. Repair Manual
3. Adjustment Procedures
4. Technical Diagrams
5. Software Installation
6. Software Tools
7. Control Center Documentation
8. BDC Control Instructions
9. DustoVac Dust Removal
10. LVM-S.2/3/4
11. Frequency Converter Unit

G. Identify the main sections in the Technical Documents:
1. Quick Procedures

H. Identify the main sections in the Training Documents:
1. Training Manual
2. Training Handouts

I. Discuss the Terms and Abbreviations Training Handout.

J. Identify Safety features and concerns while operating the machine.

K. Identify the BPS M5 external equipment - printer, reconciliation PC, server PC, et cetera.

L. Describe the method used to code the different variants of the BPS M5.

M. Identify the following:
1. the Input Module
2. the Operating Module
3. the Delivery Module(s)
4. the Shredder Module, Audit stacker, and the Fail-Safe pocket
5. the Pneumatic Unit

N. Demonstrate how to power on/off the Pneumatic Unit.

O. Identify the components used to operate and control the system (at the Machine), including:
1. the Emergency Stop buttons

2. the Drive Slow buttons
3. the various Function buttons
4. the Screen, keyboard, keypad, and mouse
5. the Chip card reader
6. the Main switch
7. the Bander Safety button (ZHT)
8. the I/O keyboards in the Delivery Module(s)
9. the Band Advance buttons

P. Provide an overview of Window XP, the Oracle databases, and the Banknote Processing software.

Q. Identify the System Users:
1. sysadmin (the System Administrator)
2. SERVICE (the Field Engineer)
3. SUPERVISOR
4. OPERATOR

R. Identify and describe the following terms:
1. Meta Section
2. Shift
3. Parameter
4. Accounting Unit

S. Discuss the manner in which rejects are handled.

T. Describe Header card processing procedures.

U. Demonstrate the procedure to process banknotes, including:
1. Logging on
2. Opening a section
3. Selecting an operating parameter

V. Discuss the difference between serial processing, parallel processing, and continuous feed processing.

W. Identify the three configurations that will be used fairly extensively during training:
1. Blanks
2. USD
3. GDD

X. Run a shift and demonstrate the process of configuring the BPS M5.

Y. Demonstrate proper procedures for shutting down.

Machine PC:

A. Identify the components of the Machine PC, including:
    1. Interfaces
    2. List of Hardware Components
    3. Layout of the MPC
    4. Hardware Connections
    5. MPC Housing
    6. COM Adapter
    7. Power Supply
    8. Housing Fan
    9. Memory
    10. PCI-Riser Card
    11. CAN Card/board
    12. MPC Software

B. Identify and describe the components of the Motherboard / CPU Board, including:
    1. JILI DVI Adapter

C. Identify and describe the interfaces of the CPU, including:
    1. Serial Port Com 1
    2. Serial Port Com 2
    3. eSATA
    4. USB
    5. Ethernet Connector 1 (Ether 1)
    6. Ethernet connector 2/3 (Ether 2/3)
    7. VGA Interface
    8. PS/2

Software Installation:

A. Discuss the Basic Principles of Installation, including:
    1. Dual Drive Installation with Internal Recovery
    2. Dual Drive Installation with External Recovery
    3. Single Drive Installation with Enhanced Recovery

B. Identify the various Installation Tools and Installation Options, including:
    1. Bootable USB Stick
    2. Boot On LAN configuration

C. Identify and describe the possible Error Messages during Installation.

D. Describe Data Structure Conventions, including:
    1. Hotfix structure
E. Perform Full Image Installation, by means of:
    1. Starting the Installation environment
    2. Booting from the USB Stick
    3. Starting the Installation with the Image Installation Utility (IIU)
    4. Continuing an Internal Recovery Installation
    5. Continuing an External Recovery Installation
F. Perform a Release and Hotfix Installation, by means of:
    1. Initialization
    2. Directly from the Image Installer Manager
    3. From the BPS application
    4. Hotfix installation
    5. Release installation
G. Perform Recovery tasks, including:
    1. Internal Recovery Installation
    2. External Recovery Installation
H. Describe how to generate and apply Customer Backups:
    1. Basic Principles
    2. Backup
    3. Restore
    4. Full Restore
    5. Fast Restore
    6. Integrity Checks after Restore
I. Describe the various Security Levels.
J. Demonstrate how to access to the Media Archive.
K. Demonstrate how to perform an Image Conversion.
L. Demonstrate how to perform a Printer Installation.

I. LESSON: Day 2

II. TOPICS: Main menu software operations

III. TRAINING OBJECTIVES:

Upon completion of this day of the course, the successful student should be able to:

- Identify and utilize the functions of the Administration utility.
- Identify and utilize the functions of the Configuration Tool.
- Identify and utilize the functions of the Event Viewer.
- Identify and utilize the functions of the Banknote Viewer.
- Identify and utilize the functions of the System Administration Tool.
- Identify and utilize the functions of the Basic User Interface (BUI) Tool.
- Identify and utilize the functions of the DB Memory Manager Tool.
- Identify and utilize the functions of the DB Access Tool.

IV. INSTRUCTIONAL TASKS:

Conduct a review of the material covered to date with a Question and Answer session.

Main Menu Options:

A. Provide an overview of Software Operations from the Main Menu:

1. Administration
2. Configuration
3. Banknote Viewer
4. Event Viewer
5. System Administration
6. Basic User Information (BUI)
7. DB Memory Manager
8. DB Access

B. Identify and demonstrate the functions of the Administration tool, including:

1. Administrator Card Access Version
2. User Rights
3. Administration Functions
4. Writing user data
5. Displaying Data on the Chip Card

C. Identify and demonstrate the functions of the Configuration tool, including:

1. Creating a sorting and stacking mode
2. Bander Format
3. Sensor Menu Items

4. Service Menu
5. Synchronizing new data with a database

D. Identify and demonstrate the functions of the Banknote Viewer tool, including:
   1. Selecting Banknote properties
   2. Defining Display Details
   3. Displaying Special Banknote Data sets

E. Identify and demonstrate the functions of the Event Viewer tool, including:
   1. Requesting the Operation logs
   2. Requesting the Machine logs
   3. Windows XP logs

F. Identify and demonstrate the functions of the System Administration tool, including:
   1. Changing the Administrator password
   2. Changing the G&D user password
   3. Setting the System time and date

G. Identify and demonstrate the functions of the Basic User Information (BUI) tool, including:
   1. Country Settings
   2. Language properties

H. Identify and demonstrate the functions of the DB Memory Manager tool, including:
   1. Settings for Automatic Data Removal
   2. Memory Usage allocation
   3. Data removal
   4. Deleting unreferenced names
   5. Deleting unreferenced history

I. Identify and demonstrate the functions of the DB Access tool, including:
   1. Data Base fundamentals
   2. Importing data
   3. Exporting data
   4. Viewing tables
   5. Editing tables

I. LESSON: Day 3

II. TOPICS: Input module Components, Operator Module Components, Sensor System, Real Time Control, and Security Systems

III. TRAINING OBJECTIVES:

Upon completion of this day of the course, the successful student should be able to:

- Identify the components in the Input Module.
- Identify the components in the Operating Module.
- Explain the sensor PC application.
- Identify the SCS interfaces.
- Explain the file structure used for the sensor configurations.
- Explain the practices of sensor logging.
- Explain the sensor error messaging convention.
- Explain how to troubleshoot sensor problems.
- Identify the individual names of the Banknote tracking photodetectors and gates.
- Explain how to perform belt tension adjustments utilizing the frequency tuner.
- Explain how to perform door cylinder adjustments.
- Explain how to perform service and maintenance tasks in the Input Module.
- Explain how to perform service and maintenance tasks in the Operating Module.
- Identify the individual Module Controllers and their functions.
- Identify the Extension Boards and their functions.

IV. INSTRUCTIONAL TASKS:

Conduct a review of the material covered to date with a Question and Answer session.

Complete Machine:

Flat Belt System:

A. Perform Flat belt removal and replacement procedures.

B. Perform Flat belt Adjustment Procedures.

C. Identify and describe the purpose of the Pneumatic Tensioner.

Round Belt System:

A. Perform Round belt removal and replacement procedures.

B. Perform Roller removal and replacement procedures, including:

9. Idler roller
10. Drive roller
11. Sensor roller

Banknote Transport:

A. Identify and describe the Banknote tracking photodetectors (iPPD).

B. Discuss photodetector nomenclature throughout the complete machine.

Pneumatic Doors:

A. Identify and describe the purpose of the Pneumatic Flap Doors.

B. Identify the safety concerns regarding the Pneumatic Flap Doors.

C. Perform Adjustment Procedures relating to the Pneumatic Flap Doors.

Large Continuous Feeder (LCF):

A. Perform a removal and replacement of the modular LCF unit.

B. Identify and describe the LCF electrical components, including:

1. Mirror reflective photodetectors
2. Inductive proximity switches
3. Fiber optic photodetectors (VOIDS)
4. Banknote Density Camera (BDC)
5. Stepper motors

C. Perform LCF Adjustment Procedures, including:

1. Mirror reflective photodetectors
2. Inductive proximity switches
3. Fiber optic photodetectors (VOIDS)
4. Banknote Density Camera (BDC)
5. Belt tension adjustments

Operating Module Components:

A. Perform Operator Panel removal and replacement procedures, including:

1. Touchscreen
2. Transport On/Off buttons
3. Singler start/Rerun/Pause buttons
4. Chip card reader

B. Identify and describe the Reject stacker components.

1. Perform Stacker wheel removal and replacement procedures.

C. Perform Emergency stop button removal and replacement procedures.

D. Identify and describe the hardware components connected to the USB Hub.

E. Identify and describe the purpose of the Frequency Converter Unit (FCU).

F. Discuss functions related to the FCU, including:

1. Installation/wiring procedures
2. Viewing and editing parameters
3. Parameter Organization

4. Steps occurring upon transport start/run
5. Steps occurring upon transport jam clearing
6. Steps occurring when the LVM.S-2/3/4 is active

Sensor System:

A. Discuss the Sensor PC application.
B. Identify and describe the interfaces between components.
C. Identify and describe the SCS Interfaces.
D. Identify and describe the SCS Backplane.
E. Identify and describe the SAP-IPS board.
    1. Perform removal and replacement procedures.
F. Identify and describe the SAP-PPC-BE board.
    1. Perform removal and replacement procedures.
G. Identify and describe the External Interfaces of the SCS .
H. Identify and describe the File Interface.
I. Discuss typical maintenance tasks.
J. Discuss how to perform Error Diagnosis.
K. Identify and describe the Centering Elements.
L. Demonstrate how to properly perform Sensor Cleaning tasks.
M. Identify and describe the Sensor Heads, including:
    1. Magnetics Sensor (M10)
    2. NotaScan2 Image Sensors
    3. Thickness Sensor (DIS)
    4. M Feature Detector (MFD)
    5. Fluorescence/phosphorescence sensor (FLP)
    6. Limpness Sensor
    7. Barcode Reader

Real Time Control – Distributed Controller System:

A. Identify the current generation of Module Controllers used in the BPS M5:
    1. MDC3NG
B. Identify the Module Controllers, their locations, and describe their functions, including:
    1. the Singler Module Controller (SMC)
    2. the Sensor Transport Controller (STC)
    3. the Gate Photodetector Controller (GPC)
    4. the Bander Printer Controller (BPC)

C. Describe the methods used to name the GPC and BPC.

D. Describe the Module Controllers interfaces, including:

   1. Communication/CAN bus
   2. Wired Output Matrix (WOM)
   3. Serial Interface RS232

E. Identify and describe the Extension Boards used in particular Module Controllers, including:

   1. DSP3
   2. MCM3
   3. BPI3

F. Describe the Software Architecture of the Real Time Control elements:

   1. Boot Software / Firmware
   2. Module Addressing

G. Identify and describe the components of the of the MDC3NG Board, including:

   1. Status Display
   2. MDC fuses
   3. Switch Groups
   4. Reset and Service Buttons

I. LESSON: Day 4

II. TOPIC: Delivery Module Components, Etest, and Large Vacuum Module (LVM)

III. TRAINING OBJECTIVES:

Upon completion of this day of the course, the successful student should be able to:

- Identify the components in the Delivery Module
- Explain the banding process.
- Explain the package extraction process.
- Explain how to perform service and maintenance tasks in the Delivery Module.
- Explain how to utilize the Etest software to perform diagnostics tests on the machine.
- Identify the components of the Large Vacuum Module (LVM).
- Explain how to perform service and maintenance tasks on the LVM.
- Explain how to decode error messages on the LVM.

IV. INSTRUCTIONAL TASKS:

Conduct a review of the material covered to date with a Question and Answer session.

Delivery Module:

A. Identify and describe the Operating Controls in the Delivery Module.

B. Identify and describe the components of the Delivery Stacker, including:

1. Stacker Drive System

C. Perform Stacker Synchronization Adjustment Procedures.

D. Perform Delivery Stacker Adjustment Procedures.

E. Identify and describe the components of the Bander subsystem, including:

1. Pneumatic Actuators
2. Magnetic Switches
3. Mirror Reflective Photodetectors

F. Describe the Banding Process (sequence of events).

G. Perform Bander Adjustment Procedures.

H. Identify and describe the Package Delivery processes, including:

1. Extracting process
2. Pushing process

I. Identify and describe the components of the Package Delivery subsystem, including:

1. Pneumatic Actuators
2. Magnetic Switches
3. Mirror Reflective Photodetectors

J. Perform Package Delivery Adjustment Procedures.
K. Identify and describe the components that comprise the Large Delivery Module(LDM), including:
    1. Magnetic Switches
    2. Capacitive Switches
    3. Actuator Motors
L. Perform Large Delivery Module Adjustment Procedures.
M. Identify and describe the components that comprise the Coupling Module.
N. Identify and describe the purpose of the Fail-Safe Compartment.

Etest:

A. Demonstrate how to utilize the Virtual Machine to run Etest.
B. Provide an overview of Etest application.
C. Demonstrate how to connect to the BPS M5.
D. Demonstrate how to perform Test Sequences.
E. Demonstrate how to perform Cylinder Timing Adjustments.

Air Supply System LVM.S-2/3/4:

A. Provide an overview of the LVM.S-2/3/4.
B. Discuss the conditions for Operation.
C. Identify and describe the Focus Control Unit.
D. Demonstrate how to check system functionality, including:
    1. Service menu display
    2. Date/time setting
    3. Version information
E. Demonstrate how to change Parameter Settings.
F. Demonstrate how to perform a TAN (Display) Test.
G. Identify and describe possible Warning and Fault messages.
H. Identify and describe the components that comprise the LVM.S-2/3/4, including:
    1. BOGE Compressor
    2. Side Channel Compressor
    3. Cyclone Filters
    4. Pressure Tanks
    5. Compressed Air Dryer (DR 8-2)
    6. Oil/Water Separator (OWAMAT)
    7. Condensate Drains (Bekomat 31)

I. Describe how to perform LVM.S-2/3/4 Maintenance and Service tasks, including:
   1. Compressor Service
   2. Filter Mats
   3. Owamat Service
   4. Bekomat Testing and Service
   5. Air Pressure Adjustment Procedures

J. Discuss common troubleshooting scenarios.

I. LESSON: Day 5

II. TOPIC: Course completion, final review, critique, and graduation.

III. TRAINING OBJECTIVES:

Upon completion of this day of the course, the successful student should be able to:

- Demonstrate proficiency in preparing the BPS M5 for production.
- Demonstrate proficiency in creating sorting and stacking modes.
- Demonstrate proficiency in operating the BPS M5.
- Demonstrate proficiency in troubleshooting the BPS M5.
- Demonstrate proficiency in preparing manual reports.
- Demonstrate working knowledge in relation to all aspects of the BPS M5.

IV. INSTRUCTIONAL TASKS:

A. Conduct a Final Review.

B. Distribute the Final Test (Online).

C. Conduct Practical Tests.

D. Direct the students to perform the Training Course Survey.

E. Conduct Graduation activities.

F. Bring Training Manuals to Logistics for shipping to Home Sites.