WORK INSTRUCTION SOFTWARE FUNCTIONAL REQUIREMENTS AND MODIFICATIONS

Work Instruction Software Requirements (15-Nov-2013):

Operator functionality

- **BU:** These criteria can be selected from a drop down menu or fixed for a given computer.
- **Plant Unit**: This criteria can be selected from a drop down menu or fixed for a given computer
- **Station name/number:** These criteria can be selected from a drop down menu or fixed for a given computer. Family: These criteria can be selected from a drop down menu or fixed for a given computer.
- **Part Number: 2 possibilities:**
    - The operator will enter the last 3 digits (*13A) and, after clicking a “go” button he will make a Choice from a list of part number result ending with those 3 digits. The operator will then select the Right Part Number.
    - The operator leaves it blank.
- **PID number: 2 possibilities:**
    - The operator has entered a P/N. By clicking on this criteria, a list of available PID’s for this P/N Will be displayed.
    - The Part Number criteria is blank. The operator enters a PID (via a scanned bar code / 2D datamatrix details).
- When selected by a ME, the first information that an operator in the machining dept. can see upon the Part number or PID and station selection is a list of the parts needed at that station. The complete PID part list is created and maintained in PeopleSoft. The complete PID part list in PeopleSoft Contains all components required to build an assembly. The fields required are:
    - Component P/N
    - Component description
    - Component quantity
    - Component Work center
- Access time: The operator waits less than 10s to get the desired selection (must consider picture & file sizes, menu, WI.
- Listing the BOM list in the system basis the Part Number.

- **Menu selection**

  Operator gets to the desired work instruction through menu clicking in 4 levels on WEB PAGE:

  i. MAIN PAGE Internet explorer introduce after connection(Main menu : WI , Quality , Maintenance , Forms , Training and Safety)
  ii. Choose the type of work instruction (ex ABU/MBU)
  iii. Choose the type of product (Family size MS08 , MSE08 , MW14 …)
  iv. Choose the station (Number of production center: 24612,….)

- **Part number selection**

  Once on the desired work instruction the operator select the part number by clicking to get a drop scroll down menu or enter the part number. Only the part numbers manufactured on the station appear and also only those in PSFT with an active manufacturing BOM in the right business unit.

- **Embedded links**

  To limit the complexity of the work instructions, when special instructions are required for special products, the operator can click on a picture or a word to link to another work instruction
  Once the operator has clicked on a link to and accessed another work instruction, he can click back to the previous work instruction without the need of re-entering the product part number

- **Access time**

  The operator waits less than 2s to get the desired selection (menu, WI, etc…)

- **Update Works Instruction**

  The operator is able to ask for update file by clicking on update button. Then a short description of problem needs to be entered and send the ME .The name of the worker and the description request will be send to the creator (or last name record for modification)

- **Submit Value**

  For the first piece inspection the operator will enter in the WI concerned all the values he measures, his name from a scroll menu and the supervisor . This values will be submit by clicking a button .The values are registered in a data base and if these values are out of tolerance the system will return a message

Administrator functionality

- Create sheet type model with all the direct links with database
- Create standard links with data base (PSFT SQL or ACCESS)
- Create sheet sort level / manage access right
- Define workflow parameters
- Update software or models

Other requirements by priority:

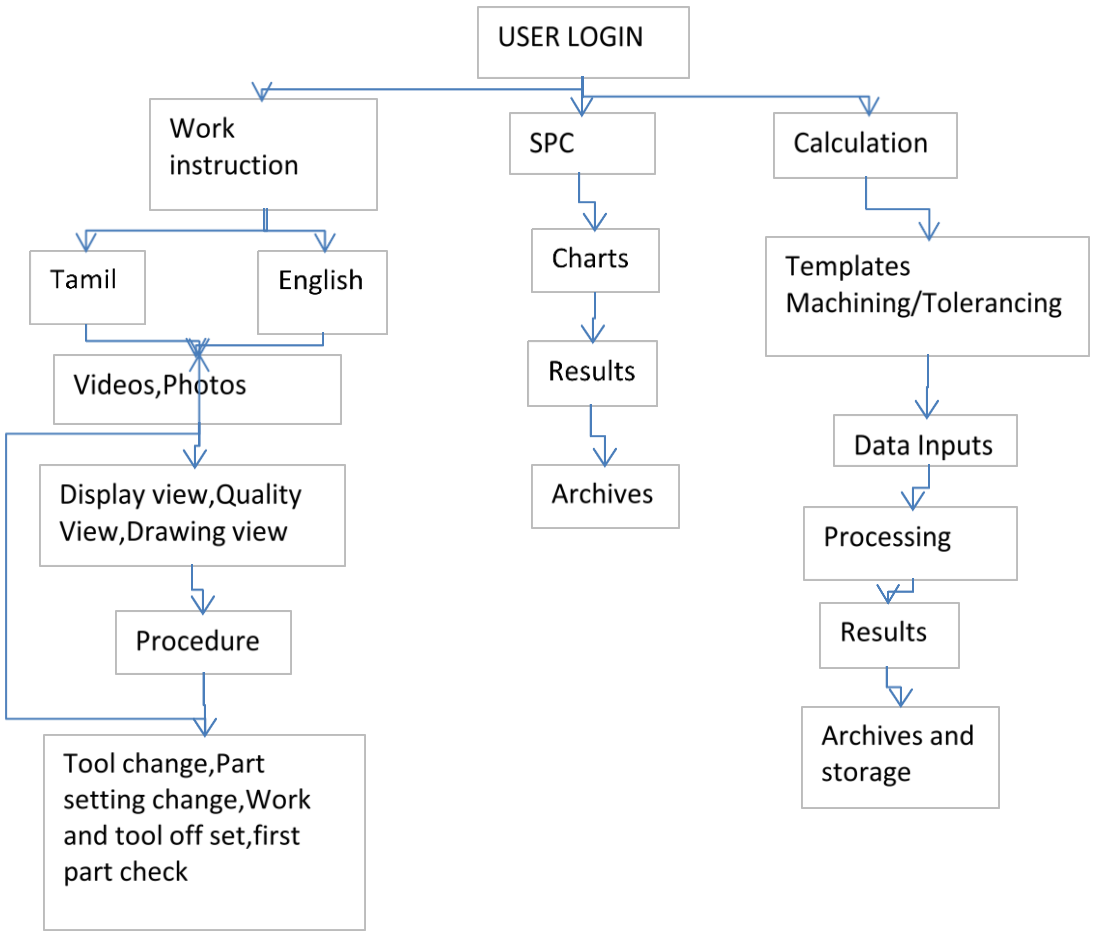
Work instruction content:

- Direct link with PSFT BOM for existing business units
- Update request from worker : each WI has a link to an update form where the operator can enter his name and his request
- Maintenance update request : Each WI has a link to an update form where the operator can enter his name and his request (this form is directly linked to the maintenance software)

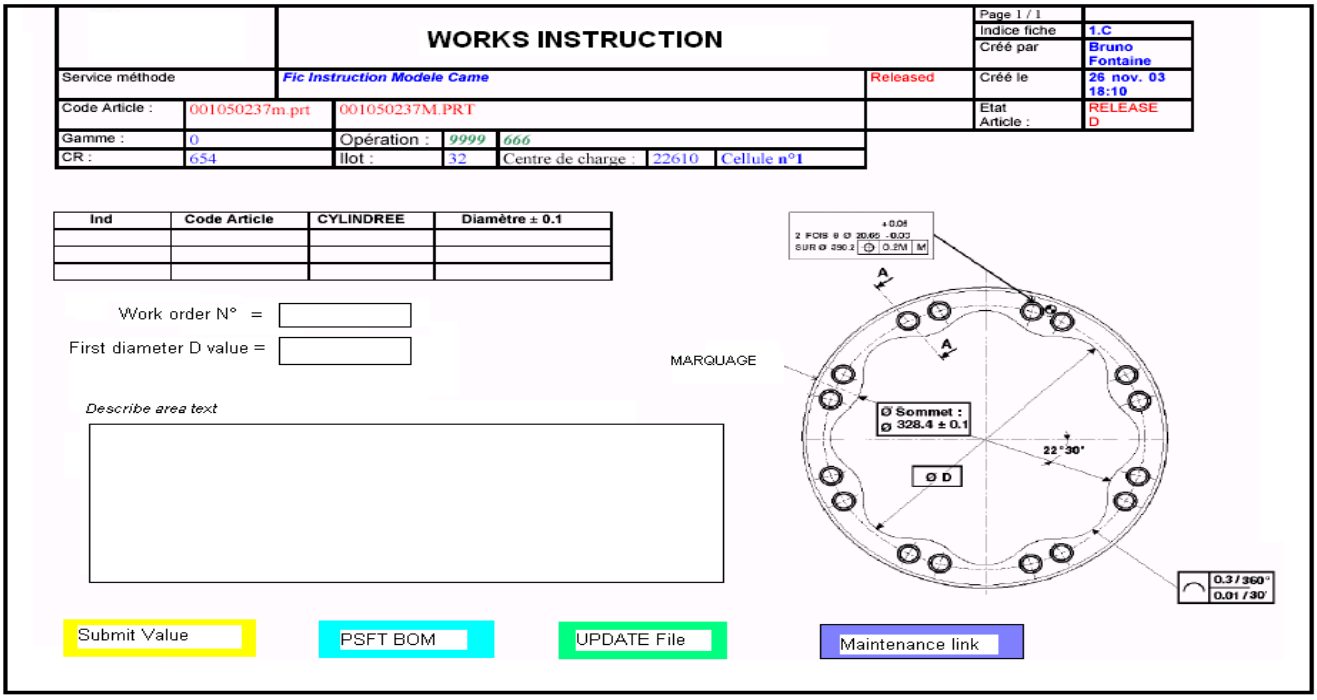
Other functionalities

- A paper copy of work instruction will have the mention “In all the case a paper copy of this document is not the reference”
- For each new version of work instruction , the history version must be complete and this history is link with the instruction file.

DATA FLOW OF WORK INSTRUCTION SOFT PROGRAM



1. Template for demonstration model

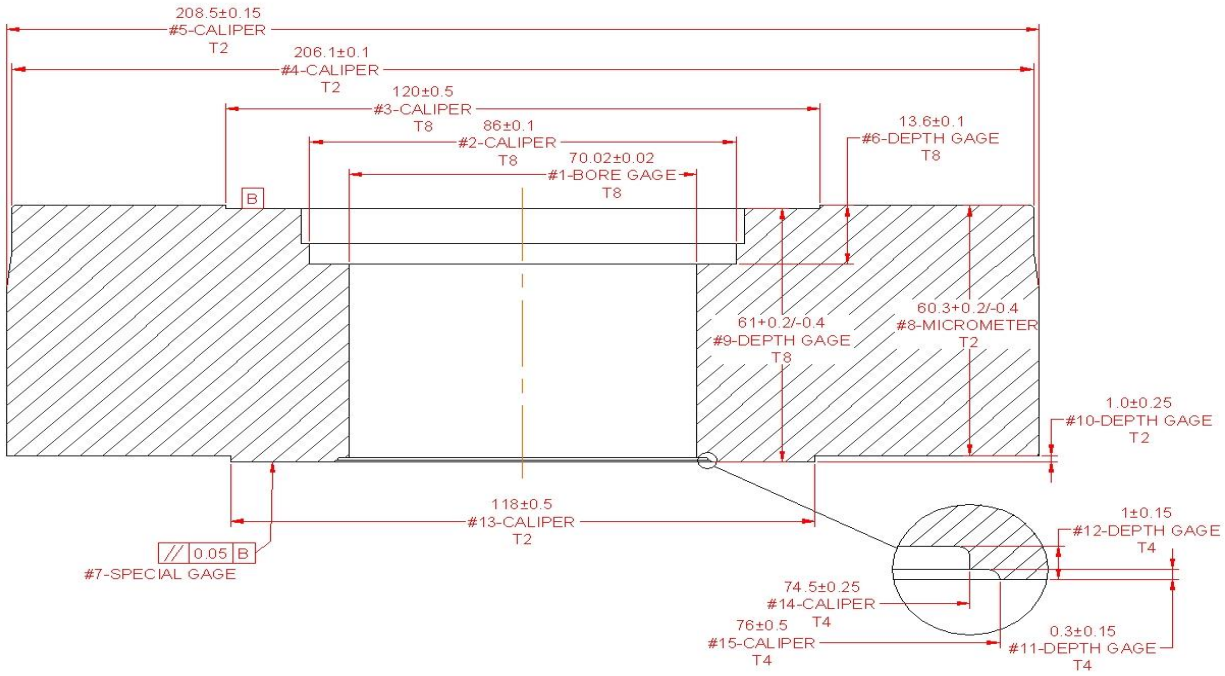


3: example of the home page

2. WI MBU TEMPLATE

M.B.U		Hessapp block First piece inspection report	WI Rev Level: C Part Revision: -
Developed by: S Mouton	Verified by:P.Ledenmat	CYL BLK-BARE,S11,PAP,T56.AR,HR	P.N: 000416392A

select part number: 000516328B



Work Instruction Software Changes (29-Nov-2013):

- Languages (Tamil translator), SPC Chart should be added in documentation.
- New form has to be added for rejection process with reason and time spent for each activity.
- During Video streaming the system should not get slow down.
- Maintenance form has to include in user side with mail option.
- Embedded system for MORPHOS machine integration will be implemented in future.
- PDM,PLM link is not necessary.
- User manual should be added in help disk menu if possible with screenshot.
- Folder archiving is mandatory and monthly backup should be maintained in server.
- Image zooming option has to be added.
- For search criteria will be done using last 3 digits of part no and it should not depend on case sensitive.
- Operator feedback form has to be added and notification will be shown on admin side.
- Calculations, Template design will be adding.

Work Instruction Software Changes (02-dec-2013):

- QC sheet entry and what are the fields user will make an entry and what data should be fetch from masters.
- In QC sheet entry dimension count may vary depends on part no and operation.
- Dim max value and min value will be validated and shown a pop up message alert.
- For user QC entries will be depends on priority like 100%,1/5 part,1/15 part etc.,
- Discussed about SPC chart formula and chart has to be generated depends on mean value.
- In QC Sheet creation date and modified date should be maintained.
- Rejection report with reason has to be generated depends on QC entry from users.
- For Embedded project integration for MORPHOS machine checked the Merlin software and gets the data format from Merlin system. Need to be analyzing the format of data.

Work Instruction Software Changes (2014):

3. SOFTWARE OVERVIEW

The Modules in Ph for Admin are as follows,

1**. Masters and Settings**

- Station Master
- Department Master
- Machine Process
- Operation Master
- Employee Master
- Assembly Number Master
- QC Value Master
- Change password

2. User Creation and Authentication

3. WI Creation

4. Upload data from excel – (Bom list, Engg db, part no, PID no)

5. Template Creation

6. Parameter table

7. Maintain update request from user

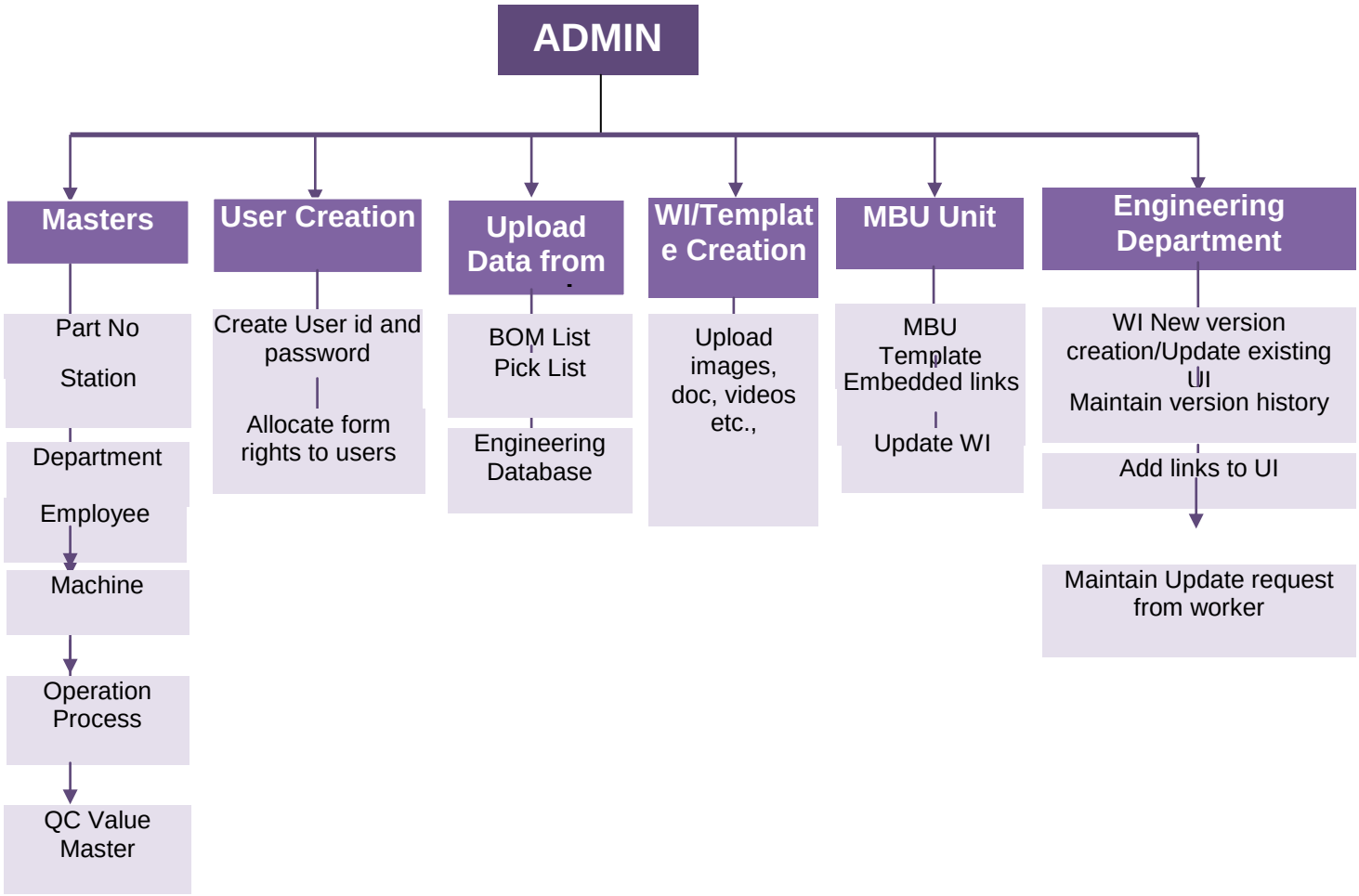
The Modules in Ph for User are as follows,

1. User Login
2. Work Instruction View
3. Template view
4. Request for update WI

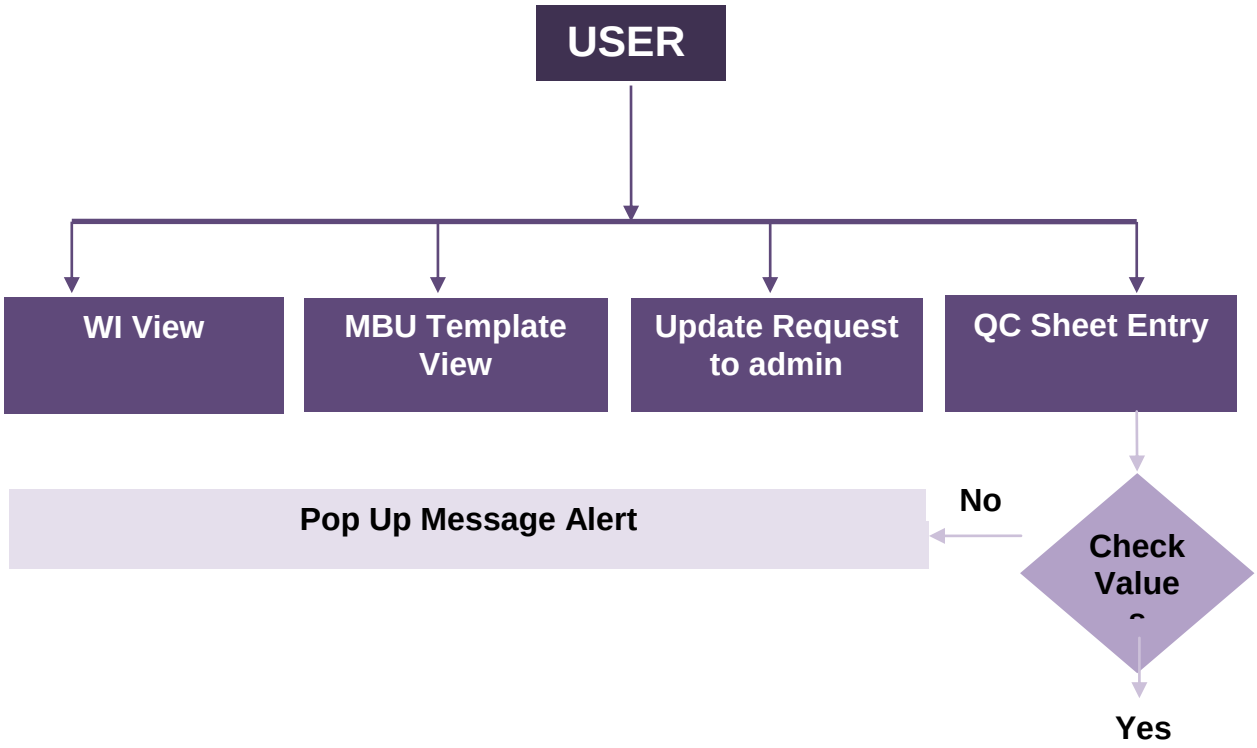
MBU UNIT

1. Main form
2. Update WI
3. Part no link
4. QC Entry

DATA FLOW DIAGRAM ADMIN ROLE



DATA FLOW DIAGRAM USER ROLE



Work Instruction Software Changes (08/Aug/2014):

Work Instruction User manual.

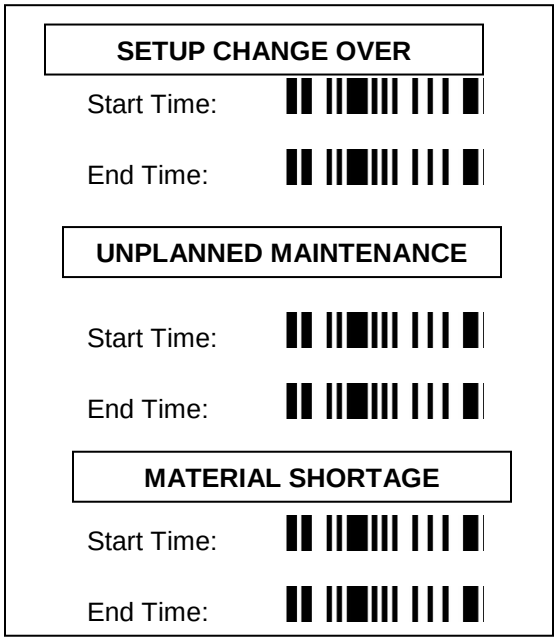
The PH work instruction software that logs-on with the instruction as follows:
Step 1: When the software logs-on it consists of three different logs on session as

- USER
- ADMIN
- SUPER ADMIN

Step 2: When we tap the **USER** navigation mode it consist of

- Logging in as user mode
- It scans for the PID's information
    - It shoots out the automatic response with the information such as PID's part number and operation is fetched from the master data
    - After scan the navigation can be done in four views such as
        - Work Instruction view
        - Quality control data
        - Production Data

- Admin generates barcodes for each and every operation done.
- Whenever the operation takes over then the bar code is read with its start and end time values of barcode.
- There are many other process done such as maintenance and setup change over and so on
- For example let us consider that for setup change over process it requires to scan for both start time and end time operation. With this the barcode is generated.



- After this process the user scans for and check the barcode information
- In the generation of automatic response with respect to product produced quantity and rejected quantity will be fetched directly to the QC sheet generation.

- Report generation
  - The report generation further executes the processing such as
    - Generates the DMT report
    - Generates OEE report
    - Generates Production report
    - Generates QC Report

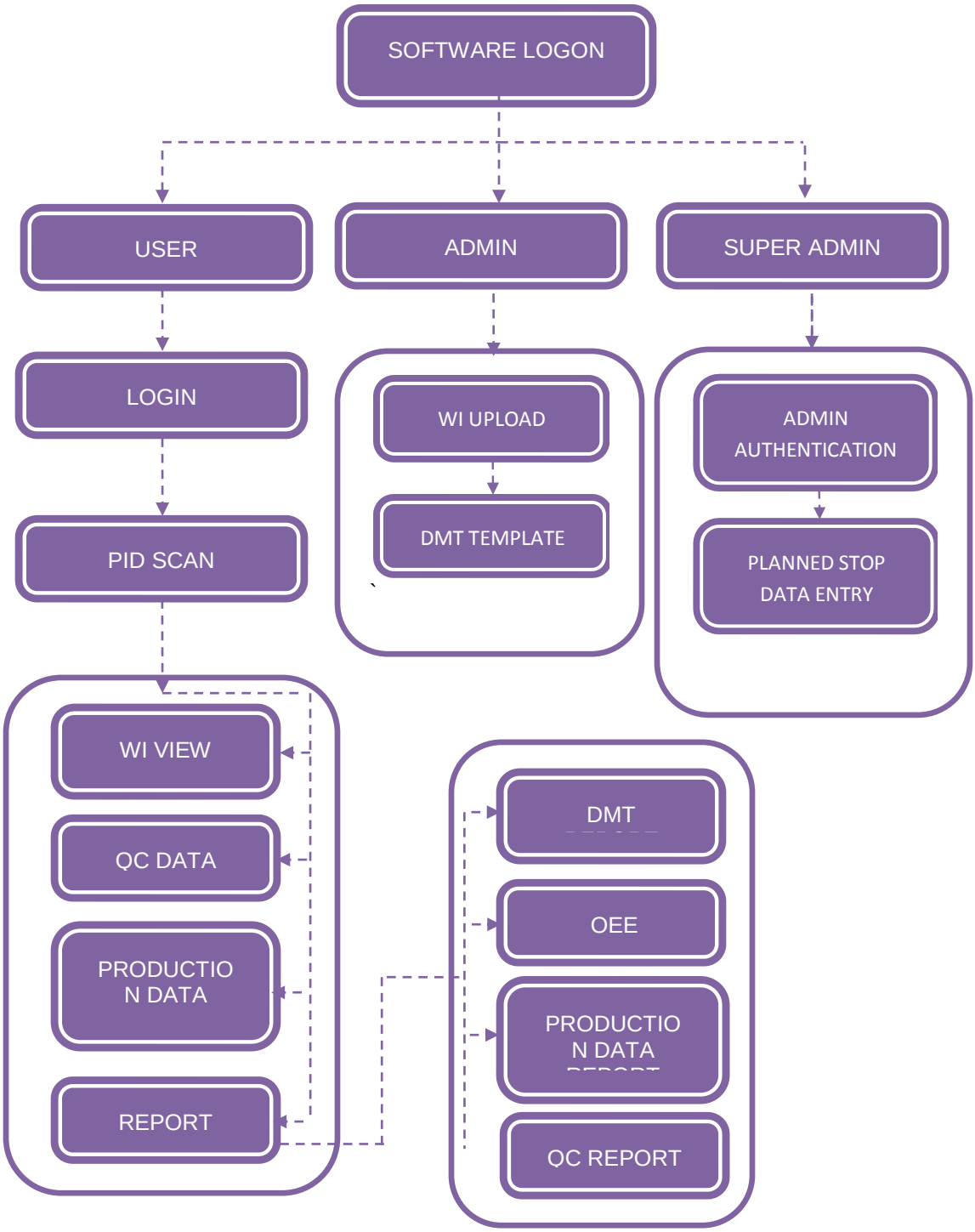
Step 3: When we tap the **ADMIN** navigation mode it consists of

- Logging in as admin

- It uploads work instruction
- Generates the DMT template

Step 4: When we tap the **SUPER ADMIN** navigation mode it consists of

- Logging in as supper admin
- It validates for admin authentication
- It generates the planned stop data entry



Work Instruction Software Changes (2014):

User Roles:

In the previous work instruction software requirement from PH they asked only two user role authentication like as

1. Admin
2. User

In the present work instruction software user role have three type of user authentication like as

1. Super Admin
2. Admin
3. User

Work Instruction Software Changes (05/sep/2014):

- In Excel Sheet the dimension values are to be changed for quality sheet that should be affected as per the charts given
- In quality sheet rejected quantity alone to be shown as red colored one other colors not to be affected as rejected quantity.
- In SPC chart as per the dimension views the mean values to be generated in each dimension views.
- In QC sheet the excel sheet to be generated.
- Some of the planned stop entry the static timings are to be allocated as per the timing given as default are:
    a. Lunch time – 20 min
    b. Tea Time – 10 min
    c. Maintenance – 15 min
    d. Shift A – 6:00 AM to 2:00 PM
    e. Shift B – 2:00 PM to 10:00PM
    f. Shift C – 10:00 PM to 6:00 AM
    g. Shift A1 – 6:00 AM to 6:00 PM
    h. Shift B1 – 6:00 PM to 6:00 AM

2. In quality sheets the machine name and supplier's name to be added as per the requirement.
3. In Efficiency calculus machine name to be added.

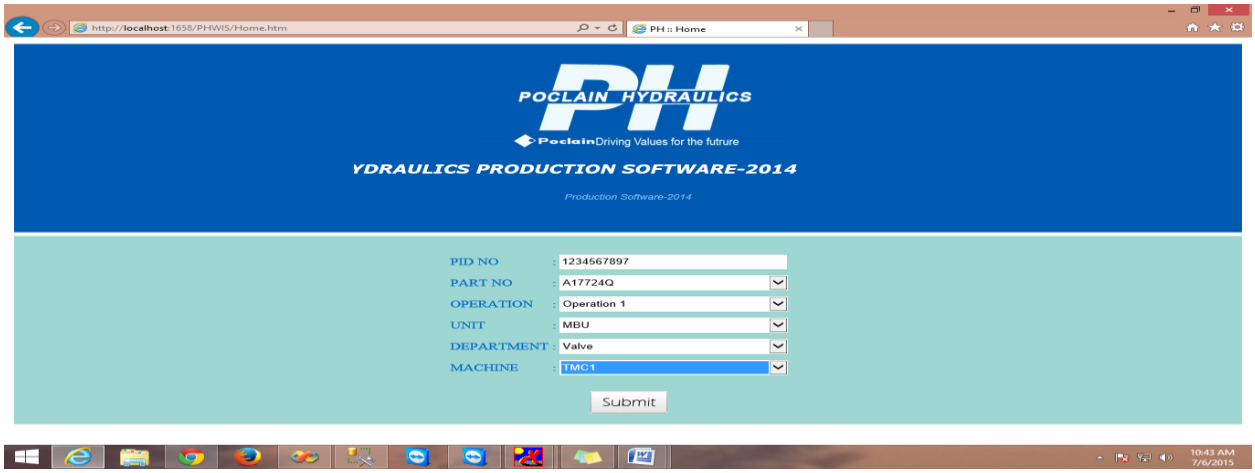
LOGIN FORM (Operator, Admin, Super Admin)

The login form modules presents in the PH login screen with username and password and shift and date fields. If the **operator** enters a valid username and password then the operator should be select the current operator shift whereas the date field will be loaded automatically. The operator will be redirect to Operator home page with valid operator details.

If the "**Super Admin**" or "**Admin**" user will be given a valid username and password whereas the types of user no need to select the shift as possible to move their home page with their valid user details.

In the above login form the user should be enter the username and password as well as need to select the working shift for entering date into quality sheet page. The admin and super admin no need to select the shift for access the work instruction software.

HOME FORM (Operator):



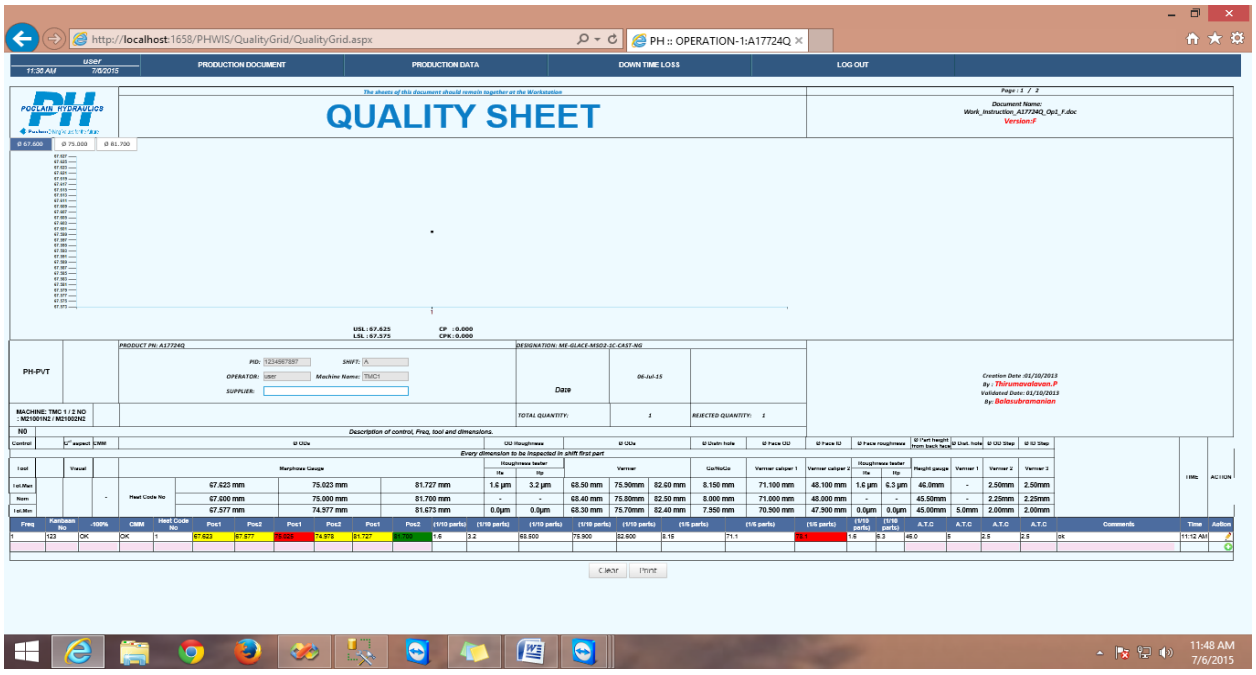
This home page will be shown to the operator only here the particular operator need the scan the motor pid number as well as the operator need to select the part number for the scanned motor pid number and select the list of operation are loaded in the operation dropdown control and the operator select the working unit are listed in the unit dropdown control when the operator select the unit values the department will be populate depending the select unit values. If the operator chooses the unit the machine dropdown control will be populated depending on the selected department values.

If the “operator” is entered the all real time values in that control the operator will be move to the quality sheet page

In the previous work instruction software requirement the operator need to enter the last three digit of the PID number for entering the quality data for the particular PID number.

In the present work instruction software the operator can able to scan the PID number as well as can able to enter the corresponding PID number manually by operator. The Part number will be shown while scan or enter the corresponding PID number in the pid number area.

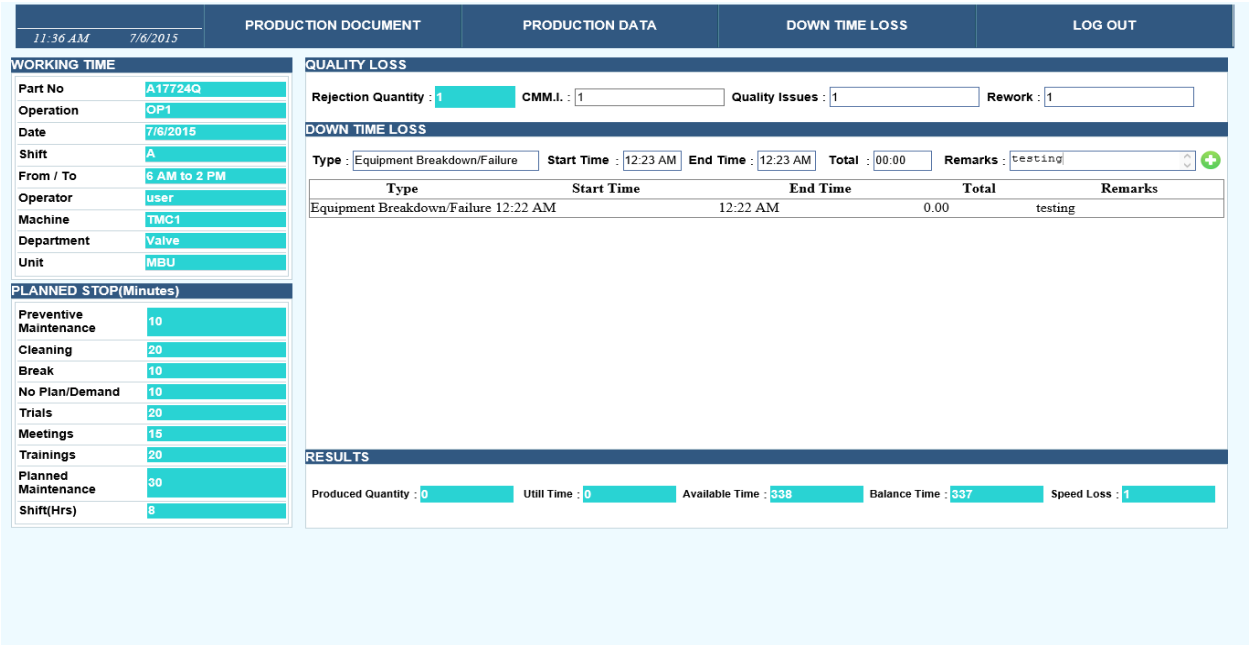
QUALITY SHEETS (Operator):



The pid number and shift and operator name and machine are shown the top of the quality sheet pages. Once the operator validate the motor then the operator move to the quality sheet for need to enter the motor validated values in the quality sheet.

In the top of the grid header we will show some marphoss , roughness, vernier ranges etc.
If the operator enter the marphoss between the max and min values that will be shown in green caption. If the entered values is less than the marphoss max and min values that will be shown red caption. If the entered values is equal to the marphoss max and min values that will be shown in yellow captions.
The Roughness tester values and Vernier as possible to enter for every 10th row. The Go/NoGo and Vernire Caliper 1 and Vernier Caliper 2 as possible to enter for every 5th row. The operator can able to edit “VISUAL” and “CMM” values only possible.
If the operator enters the all valid motor values and saves to the database while save all values the total quantity and if the operator enter any rejected values will be shown in top of the page like total number will be show with “total quantity” captions and if any rejected values is enter it will show with “ rejected quantity” caption. The quality sheet chart will be generated on top of the page for every row entry.

DOWNTIME LOSS (OPERATOR):



This screen will be capture the losses time in the operator working shifting. If there is any machine break down problem occurred in the current operator shift finally the operator need to add the type of break down occurred in their shift. The list of down time type are converted to barcode format so the operator need to scan the what type of break down in that downtime type barcode listed. The operator current working shift

details are listed in the form of left side in that screen and planned stop hours are also listed in the form of left side screen.

The operator can added any number of downtime loss type. This down time loss time will be reduced total working hours in that day. The reduced time will be shown in the “Available Time” and “Balance Time” caption. In that “Speed Loss” caption will adding the total loss time in that screen. This screen will be shown the total number of produced and rejected quantity in this current operator shift.

Work Instruction Software Changes (*22/Sept/2014*):

1. Window should request for plant efficiency as follows
    - In user login Pid scan, department details, and unit selection such as ABU/MBU, or overall (ABU + MBU) units to be implemented.
    - Types of indicator→OEE, Labor efficiency, OPE should be implemented
    - From and to date should be displayed as DD/MM/YYYY
    - Pareto chart to be displayed based on the down time loss for OEE, OPE and Labor efficiency time.
    - Edition of reports to be done for all templates as follows:
        - OEE Report, OPE Report and labor efficiency report.
2. Plant OEE/LET
    1. Calculation for **labor efficiency = Earned time/Actual time**
    2. **LET = No. of parts X Time**
    3. Earned time to be automatically generated whereas the actual time to be manually calculated.

    - OEE/LE
    - Number of produced part
    - Down time loss total hour
    - Down time loss type - In hour
    - Planned stop(hrs)
    - OEE/LE per shift {G, A, B, C, A1, B1}.

3. ABU→OEE/LET and MBU →OEE/LET
4. User should select the department which they want to view. As given below:
    - Test bench
    - Painting
    - Valve
    - Block
    - Shaft

For all the above listed department need to generate the following details

OEE: The overall Equipment Effectives can be calculated based on the TRS as given format of (**OEE = TRS = t_u/t_r** ie. T_u is the utile time and t_r is the required time).

OPE: The Overall Plant Efficiency can be calculated based on the TRG as given format of (**OPE = TRG = t_u/t_o** ie. T_u is the utile time and t_o is the plant operating time).

LET: The labor earned time can be calculated based on the part number and the operation cycle time. The earned time is calculated based on the accepted quantity in overall the part numbers and overall operation cycle time. The formula calculation for **earned time = No. of accepted quantity X Operation cycle time**. Overall labor efficiency calculation can be formatted as **labor efficiency = earned time/ actual time.**

5. Report to be generated based on the machine name that should consist of OEE/LE, Downtime loss/type, Downtime total, planned stop time.

6. Pareto chart to be generated based on the downtime loss with respect to hrs and type. The report should be generated for monthly, daily and weekly. Times should be displayed below the chart based on the OEE and OPE.

Work Instruction Software Changes (26/Feb/2015):

- The **Micrometer/Marphoss** (OD dimension) condition will be enabling on 1/15 in all Polishing Sheets.
- The **Roughness Tester** condition (1/10) will be removed from all Polishing Sheets and changed to enable 100%.
- **OD Dimension** values color changes depend on dimension ranges.
- In **QC report** the shift values will be optional for search views.
- The **Flatness gage** value will be changed to 3.5 instead of 3 in Lapping Sheet.
- The **Quality Sheet** values want to select particular row and column wise in **Excel Report**.
- Create dynamic quality sheet for all department.
- Generate Dynamic Sheets for all Part Numbers with Editable options.
- The SPC chart will be generate dynamically depends on selecting columns such as Micrometer, Roughness Tester, Vernier,
  Vernier Caliper, Go/No Go, Height Gauge.

Work Instruction Software Menu Changes (*2014*):

The work instruction software all menus will be shown by a corresponding user authentication as below.

1. The **Production Document, Production Data, Down Time Loss and Log out** those corresponding menus will be shown to user authentication.
2. The **Production Document, Reports and Log out** those corresponding menus will be shown to admin authentication.
3. The **Master, Production Document, Production Data, Reports and Log Out** those corresponding menus will be shown to the Super admin authentication.

Work Instruction Software Quality Sheet Changes (2014-2015):

When the operator scan or enter the particular PID number in home page those corresponding part number quality sheet will be displayed in the next screen to the operator for entering the validated quality data for the corresponding PID number into the corresponding Motor Part Number.

The SPC chart will be generated automatically in top of the screen while the operator enters the every new quality data values depending on the MAX, MIN and MEAN values.

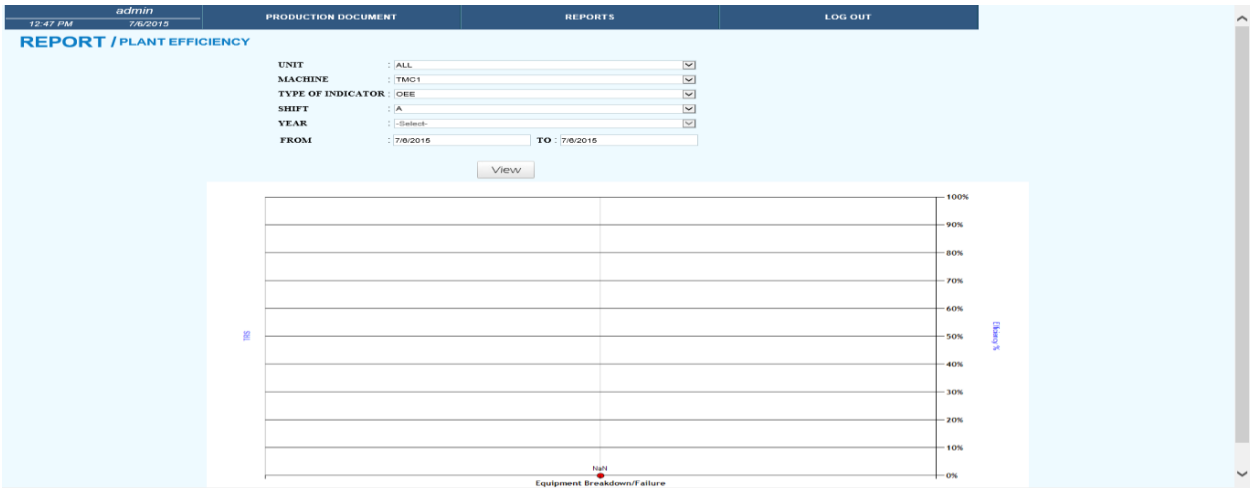
The reports are classified in to 4 types are listed below.

a) All Reports
b) Planned Efficiency
c) View QC Reports
d) Planned OEE/LET

ALL REPORTS:

In this screen “Admin” and “Super Admin” can view the all reports page. In that type dropdown control we loaded list of report type like “DMT “,”SPC CHART” etc.
The “Admin” or “Super Admin” need to select the Report Type, Unit, Machine, Part no, Process, Shift and from and to date and fire the view button the “SPC CHART” will be show below like mention the above screen.

PLANNED EFFICIENCY (ADMIN & SUPER ADMIN):

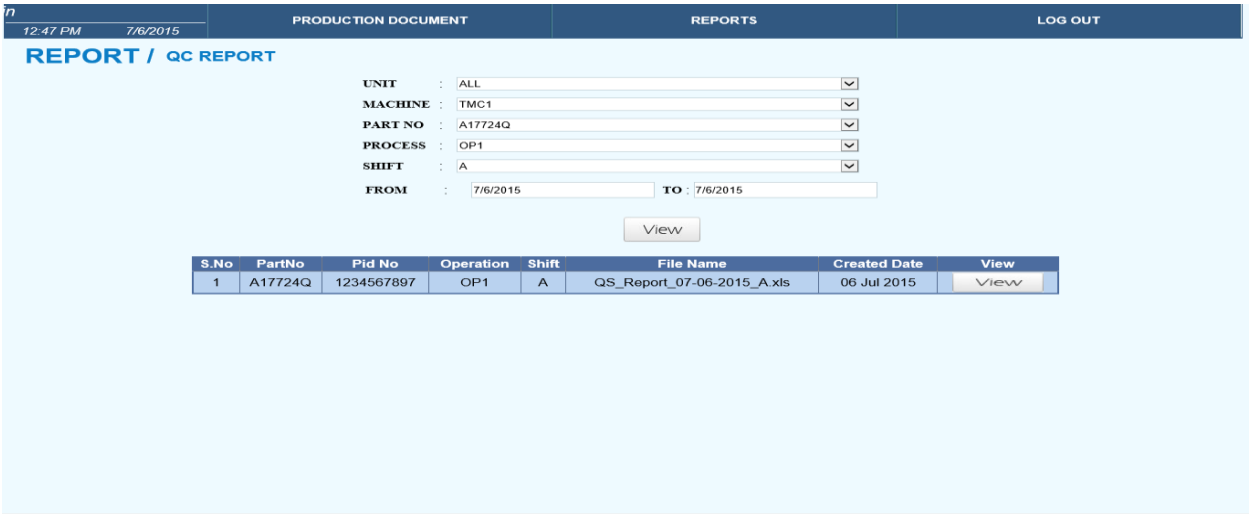


In this screen can able to view “Admin” and “Super Admin” only. In this screen the “Type of indicator” dropdown control have been loaded list of fields like.

a) OEE.
b) Labor efficiency-Date.
c) Labor efficiency-Year.
d) OPE.

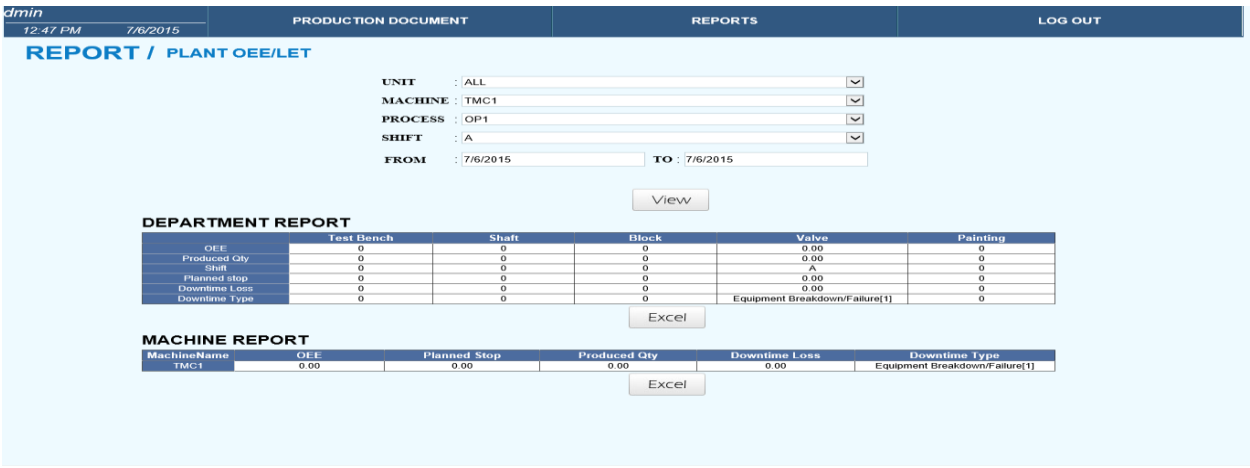
The “Admin” or “Super Admin” needs to select the Unit, Machine, Type of Indicator, Shift, Year, from and to date and fire the view button it will show the number of downtime failure list ratio in percentage values.

VIEW QC REPORTS (ADMIN & SUPER ADMIN):

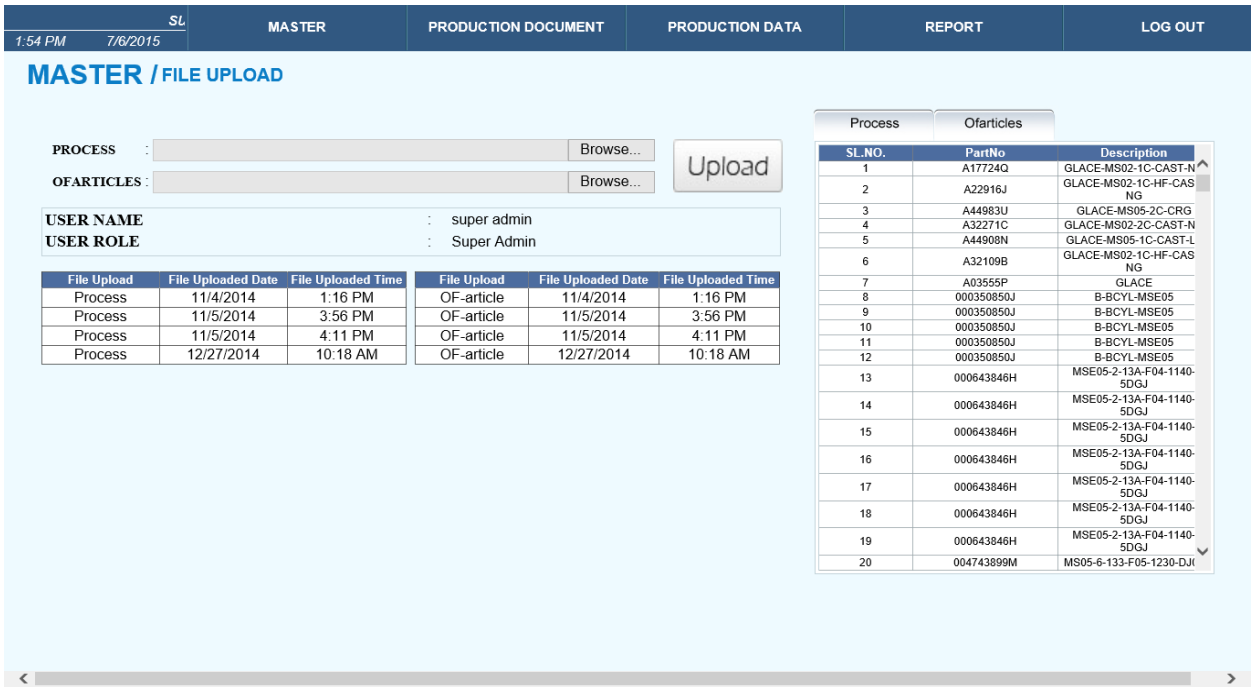


In this screen can able to view “Admin” and “Super Admin” only. The “Admin” or “Super Admin” needs to select the Unit, Machine, Part no, Process, Shift, from and to date and fire the view button it will show the quality sheet excel file and click the view button in the grid box the select quality sheet excel file will be opened.

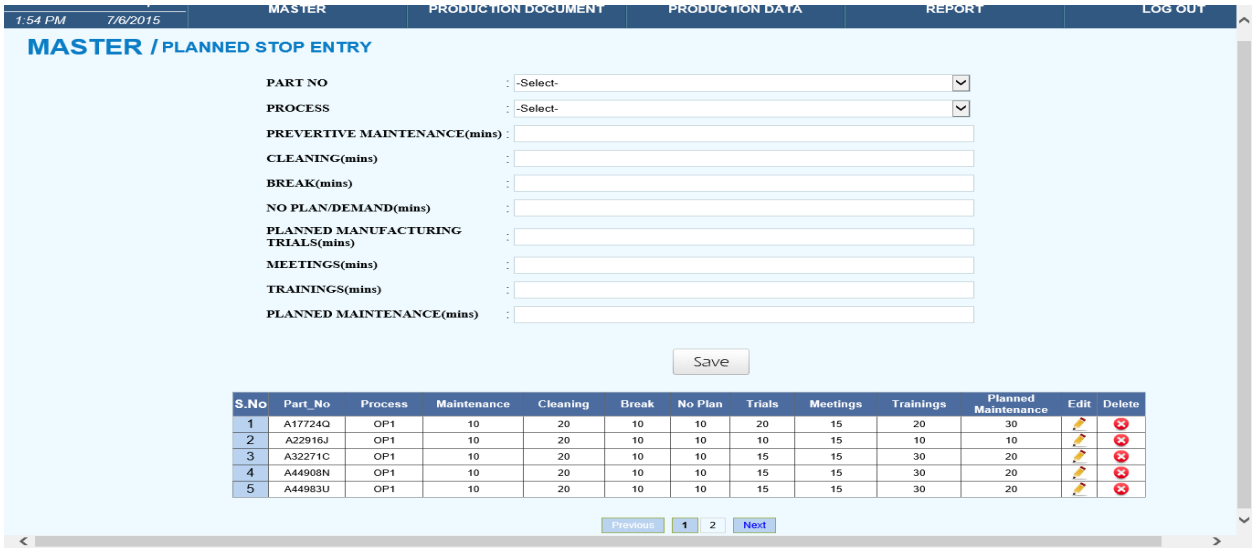
PLANNE OEE/LET REPORTS (ADMIN & SUPER ADMIN):



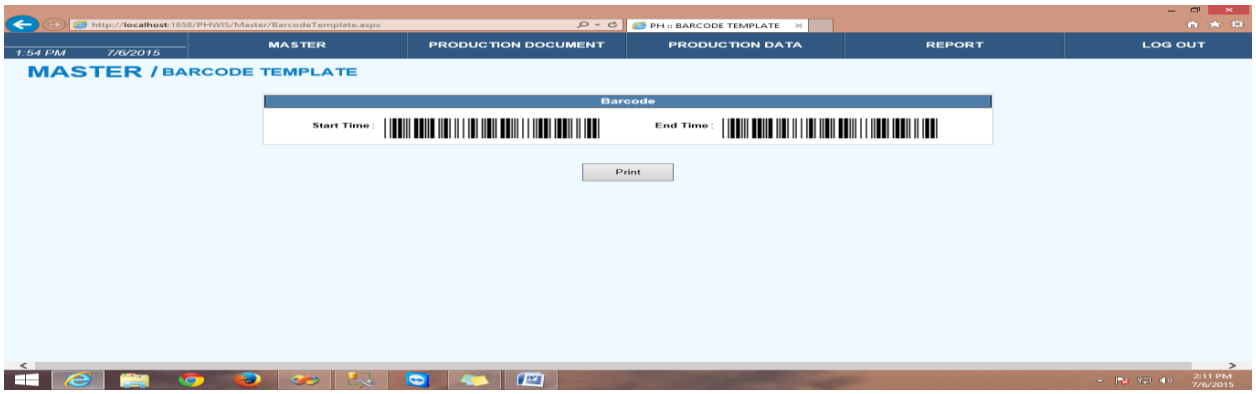
In this screen can able to view “Admin” and “Super Admin” only. The “Admin” or “Super Admin” needs to select the Unit, Machine, Process, Shift, from and to date and fire the view button it will show the department wise report and machine wise reports.



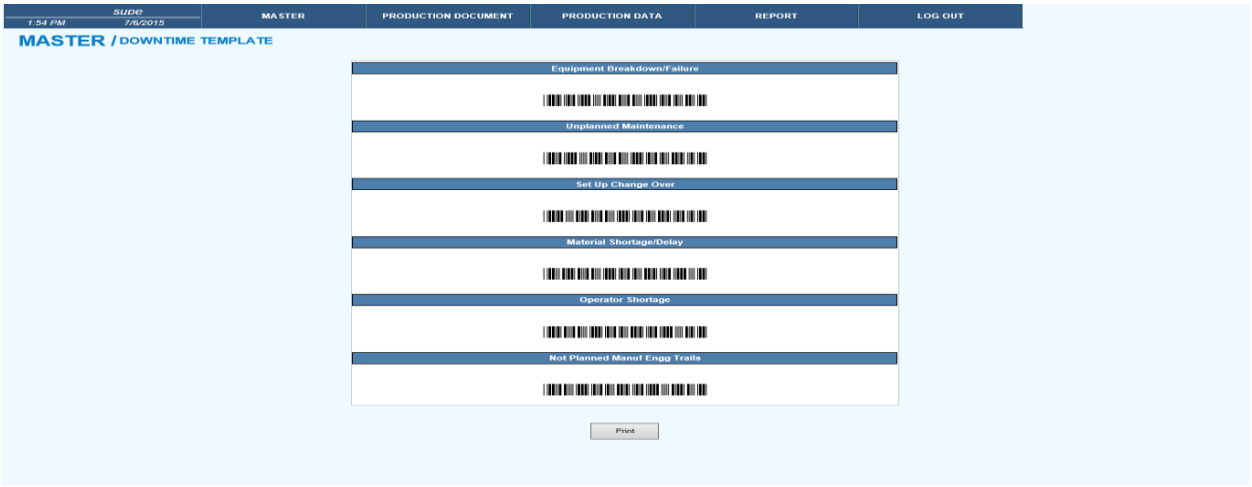
In this screen will be handled by “Super Admin”. Here the super admin will be load the “Process” and “Part No” details. In the first file upload control caption with Process is using to uploading the what are the “process” will be available in the “work Instruction Software” these uploaded process details will be display to operator screen. In the second file upload control caption with Of Articles is using to uploading what are the “Part no” will be available in the “work Instruction Software” these uploaded “Part No” details will be display to operator screen.



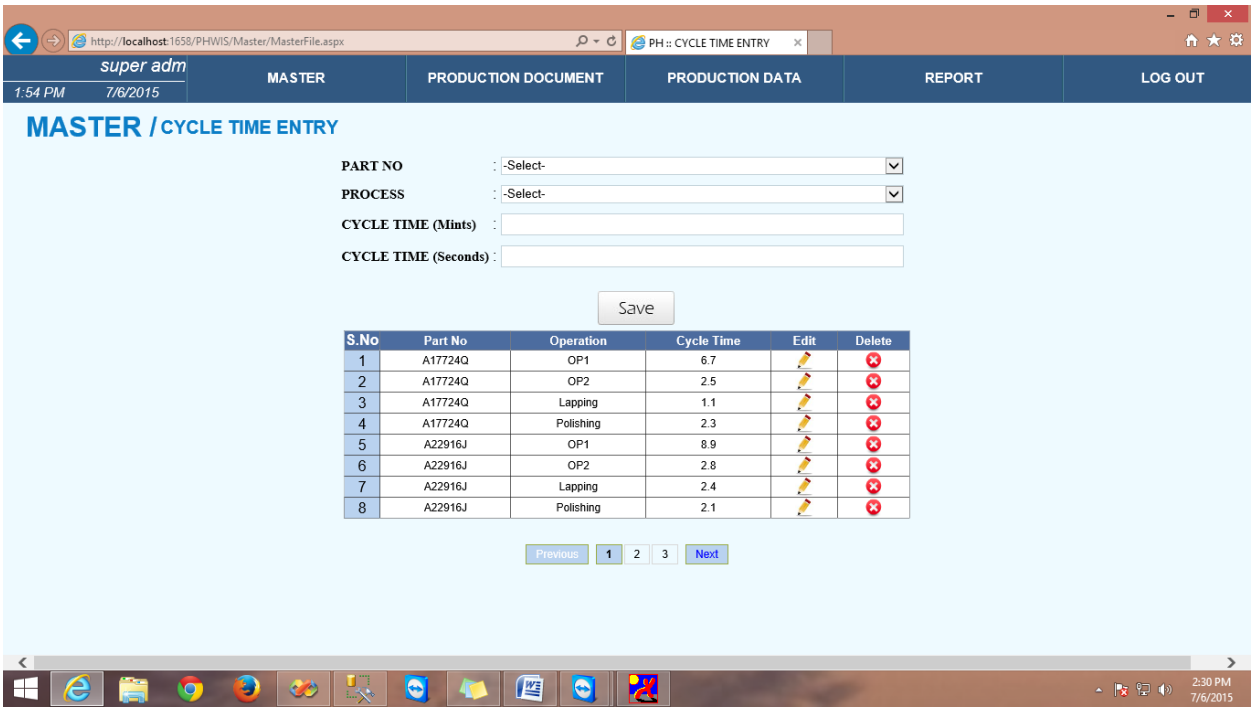
In this screen the “Super Admin” will be adding the planned stopping time. The “Super Admin” selects the “Part No” and “Operation” and adding the planned stopping time for those selected part no. Those all values are converted to minutes and calculated with operator working hours. The “Super Admin” will be able to add, edit, delete the planned stop hours.



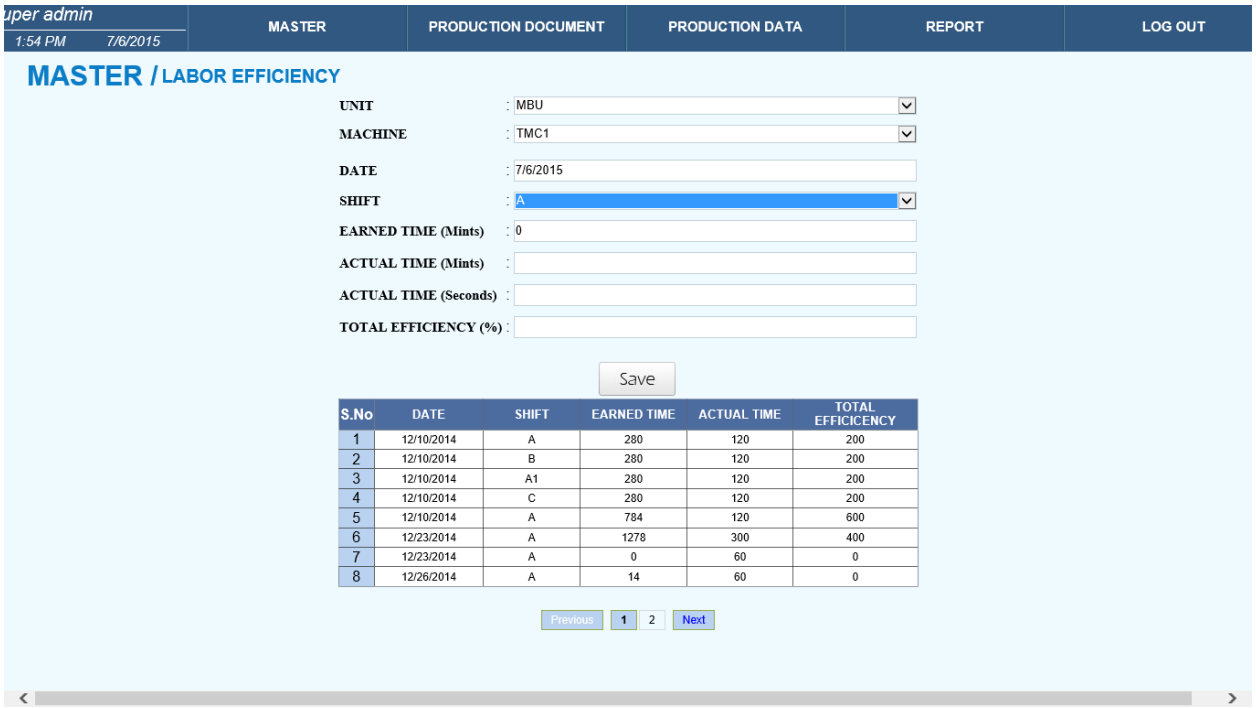
In this screen having the barcode image with “’Start Time” and “End Time” caption. The operator needs to scan the “Start Time” and “End Time” barcode the current time will be displaying in the “Downtime Loss screen” the start time and end time data capture field control.



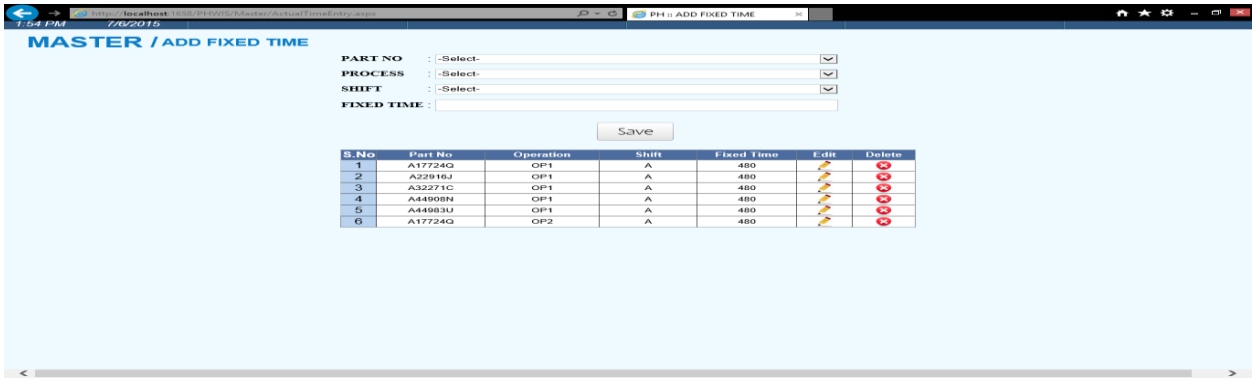
In this screen having all the downtime loss list type have been converted as barcode template. The operator needs to scan the downtime loss barcode image in the “Downtime Loss Type” data capture field at “Downtime Loss” Page.



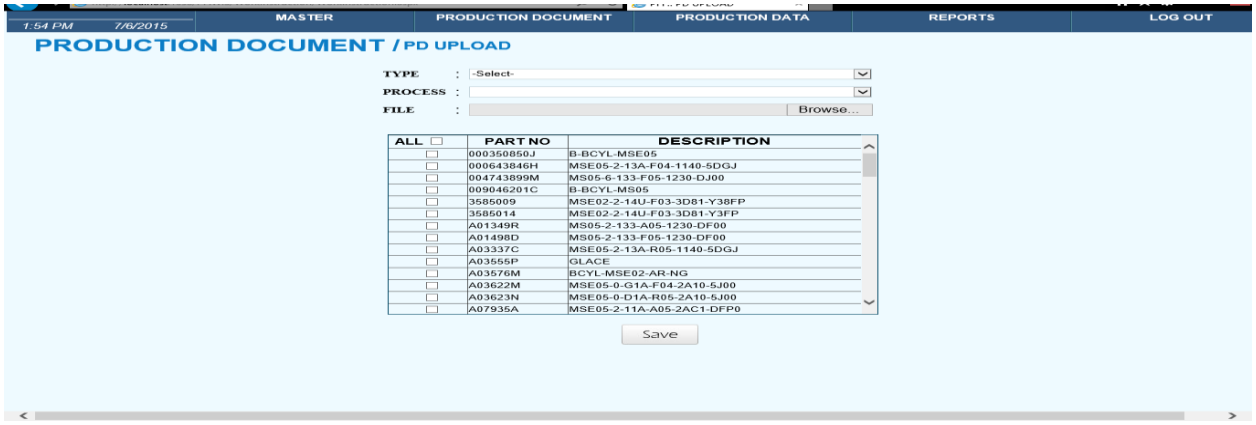
In this screen the “Super Admin” need to add the cycle time for manufacturing one motor for the particular “Part no” and “Operation”. The “Super Admin” can able to add, edit, and delete the cycle entry details.



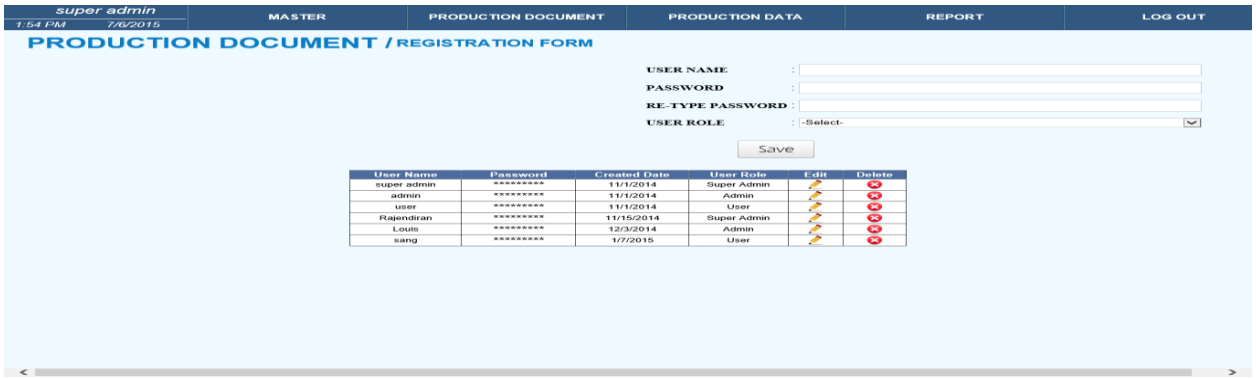
In this screen the “Super Admin” will need to select the particular unit, machine, date, shift the total number of earned time will be shown the “Earned Time” data capture filed. The Super Admin will add the actual earned time for the selected unit, machine, date, and shift the total efficiency will be calculated and show in the “Total Efficiency” data capture field with percentage values.



In this screen the Super Admin can able to add the working hours in Minutes for the single shift. Super admin can add, edit, and delete the fixed time details.



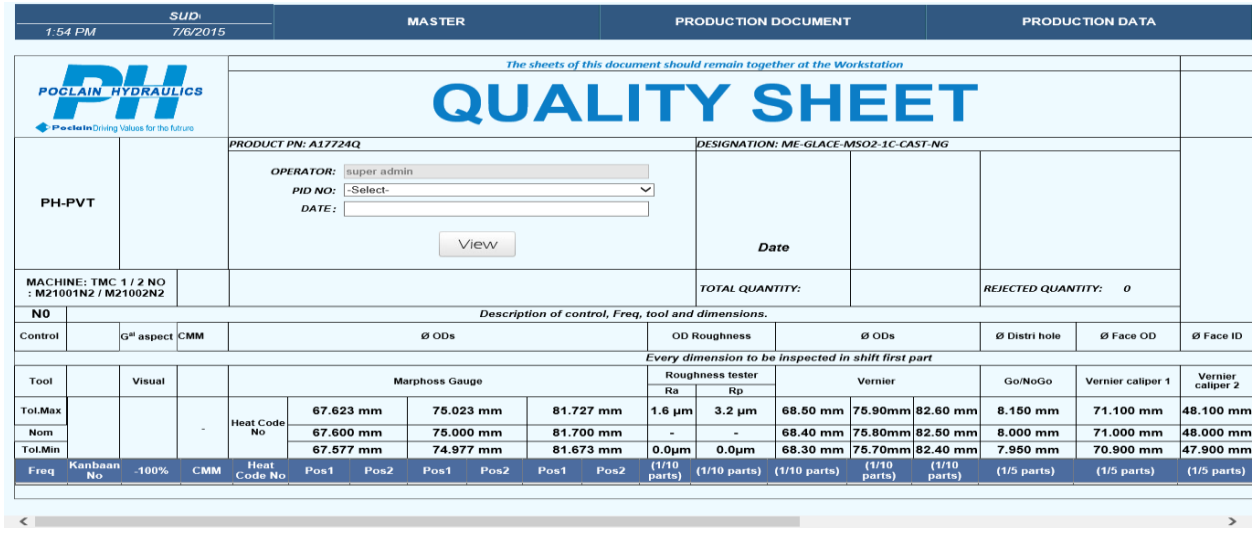
In this screen Super Admin will able to upload the work instruction document details for the process and list of uploaded type are loaded in type dropdown control. Those uploaded document details will be displaying to operator.



In this screen the “Super Admin” can provide the User Name and Password for the Operator. Here Super Admin can add any number of user name and password for the operator. Super admin can add, edit, and delete the operator details.

Quality Sheets:

a) Quality Sheet A17724Q
b) Quality Sheet QSA22916J
c) Quality Sheet A32271C
d) Quality Sheet A44908N
e) Quality Sheet A44983U
f) Lapping Sheet A17724Q, QSA22916J, A32271C, A44908N, A44983U
g) Operation2 Sheet A17724Q
h) Operation2 Sheet QSA22916J
i) Polishing Sheet A17724Q, QSA22916J, A32271C, A44908N, A44983U



SUD
1:54 PM 7/6/2015

MASTER | PRODUCTION DOCUMENT | PRODUCTION DATA

POCLAIN HYDRAULICS
Poclain Driving Values for the future

The sheets of this document should remain together at the Workstation

QUALITY SHEET

PRODUCT PN: A17724Q | *DESIGNATION: ME-GLACE-MSO2-1C-CAST-NG*

PH-PVT

OPERATOR: super admin
PID NO: -Select-
DATE :
View

Date

MACHINE: TMC 1 / 2 NO : M21001N2 / M21002N2

TOTAL QUANTITY:

REJECTED QUANTITY: 0

N0 | *Description of control, Freq, tool and dimensions.*

Control		Gᵉˡ aspect	CMM	Ø ODs			OD Roughness		Ø ODs			Ø Distri hole	Ø Face OD	Ø Face ID
				Every dimension to be inspected in shift first part										
Tool		Visual		Marphoss Gauge			Roughness tester Ra	Roughness tester Rp	Vernier			Go/NoGo	Vernier caliper 1	Vernier caliper 2
Tol.Max			-	Heat Code No	67.623 mm	75.023 mm	81.727 mm	1.6 µm	3.2 µm	68.50 mm	75.90mm	82.60 mm	8.150 mm	71.100 mm	48.100 mm
Nom					67.600 mm	75.000 mm	81.700 mm	-	-	68.40 mm	75.80mm	82.50 mm	8.000 mm	71.000 mm	48.000 mm
Tol.Min					67.577 mm	74.977 mm	81.673 mm	0.0µm	0.0µm	68.30 mm	75.70mm	82.40 mm	7.950 mm	70.900 mm	47.900 mm
Freq	Kanbaan No	-100%	CMM	Heat Code No	Pos1	Pos2	Pos1	Pos2	Pos1	Pos2	(1/10 parts)	(1/10 parts)	(1/10 parts)	(1/10 parts)	(1/10 parts)	(1/5 parts)	(1/5 parts)	(1/5 parts)

In this screen the Super admin possible to select the pid no and date if the condition is possible to checking with our database the possible condition details will be loaded in the quality sheet grid. The Super Admin can able to edit and update all values in the quality sheet grid

DATA FLOW OF WORK INSTRUCTION SOFT PROGRAM CHANGES (2015):