



Real Time Information — Currency of the New Decade

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Oji Paper's Case Report & Expansion Plan of PI Usages

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Oji Paper Co., Ltd.

Contents

1. Overview of Oji Paper Company & Paper Manufacture
2. PI Deployment
3. PI Utilization
 - a. Fuji Mill
 - b. Kasugai Mill
 - c. 3 Mills, Bulk Purchase
 - d. Tokai Mill
4. Future Plans

Who we are



- Founded February 12, 1873
- Established August 1, 1949
- Paid-in Capital 103,880 Million Yen (2009)
- Sales 11,084 Million \$ (2008)
Largest Paper Company in Japan, No.6 in the world
- Major Business Lines
Production, conversion/processing and sales of printing, writing and related papers; packaging and wrapping papers; carbonless papers; household products; containerboard and boxboard. Production and sales of such end-use products such as corrugated board and boxboard containers; paper-board containers; plastics; thermal paper; self-adhesive paper and disposable paper diapers. Production and sales of chemicals for paper making and packaging equipment. Leasing of Company's land and property. Reforestation inside Japan and overseas; maintenance of Company owned forests.
- Number of Employees 20,415 (2008)
- Number of Mills 9 (Kushiro, Tomakomai, Fuji, Kasugai, Kanzaki, Yonago, Kure, Tomioka, Nichinan)
- Group Companies Oji Paperboard (11 mills),
Oji Specialty Paper(4 mills), Oji Nepia (3 mills)

Paper Making Process: Chips ~ Products

Recovery Boiler

Steam

Electric

Combustion

2. Digesting :
Boil chips → Pulp
Pulp
Black Liquor

3. Bleaching Pulp

1. Cut-up : Make chips

5. Paper making

4. Beating :
Beat Pulp Fiber

Waste Paper processor

Related Facility:

1. Electricity → Power Generator, Receiver, Distributor
2. Steam → Boiler
3. Water → Drainage equipment

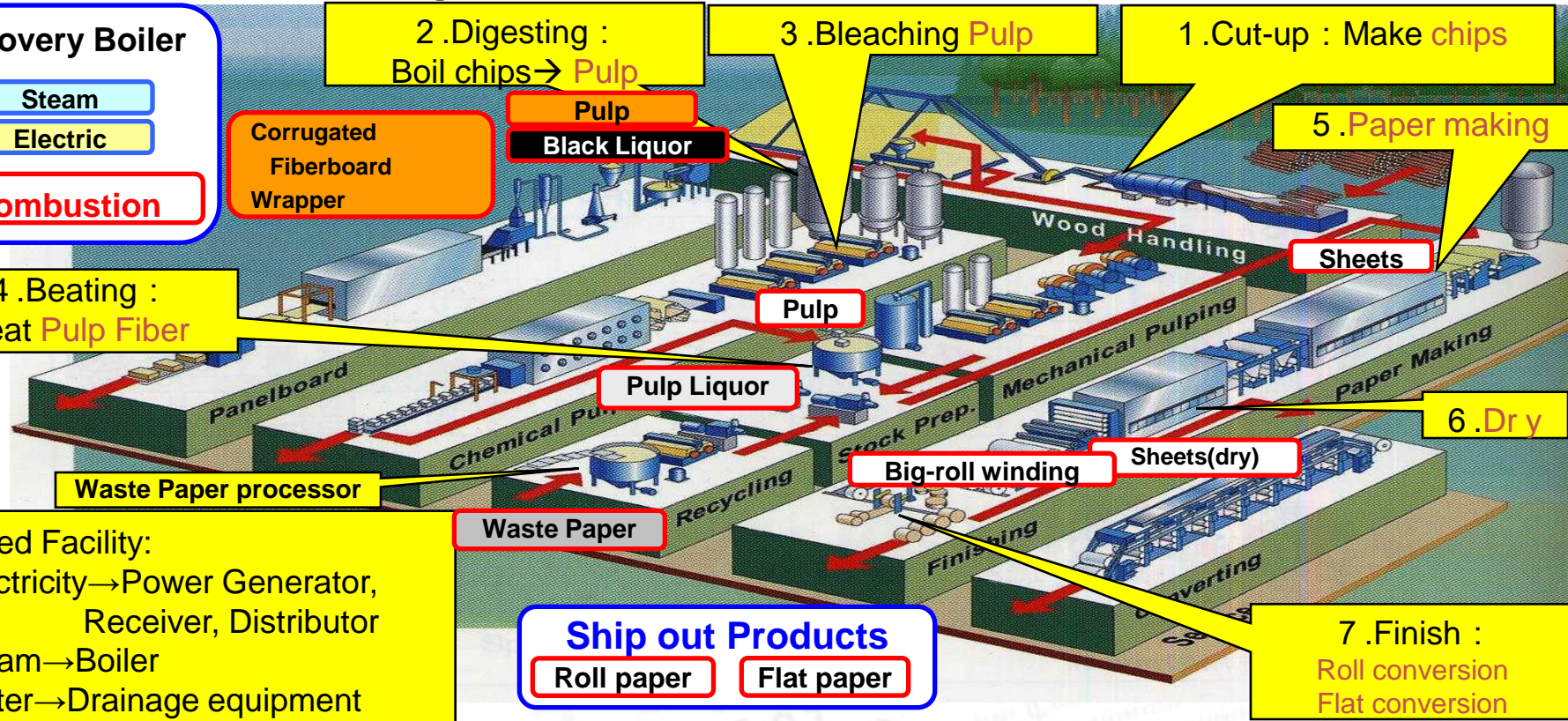
Waste Paper

Ship out Products

Roll paper

Flat paper

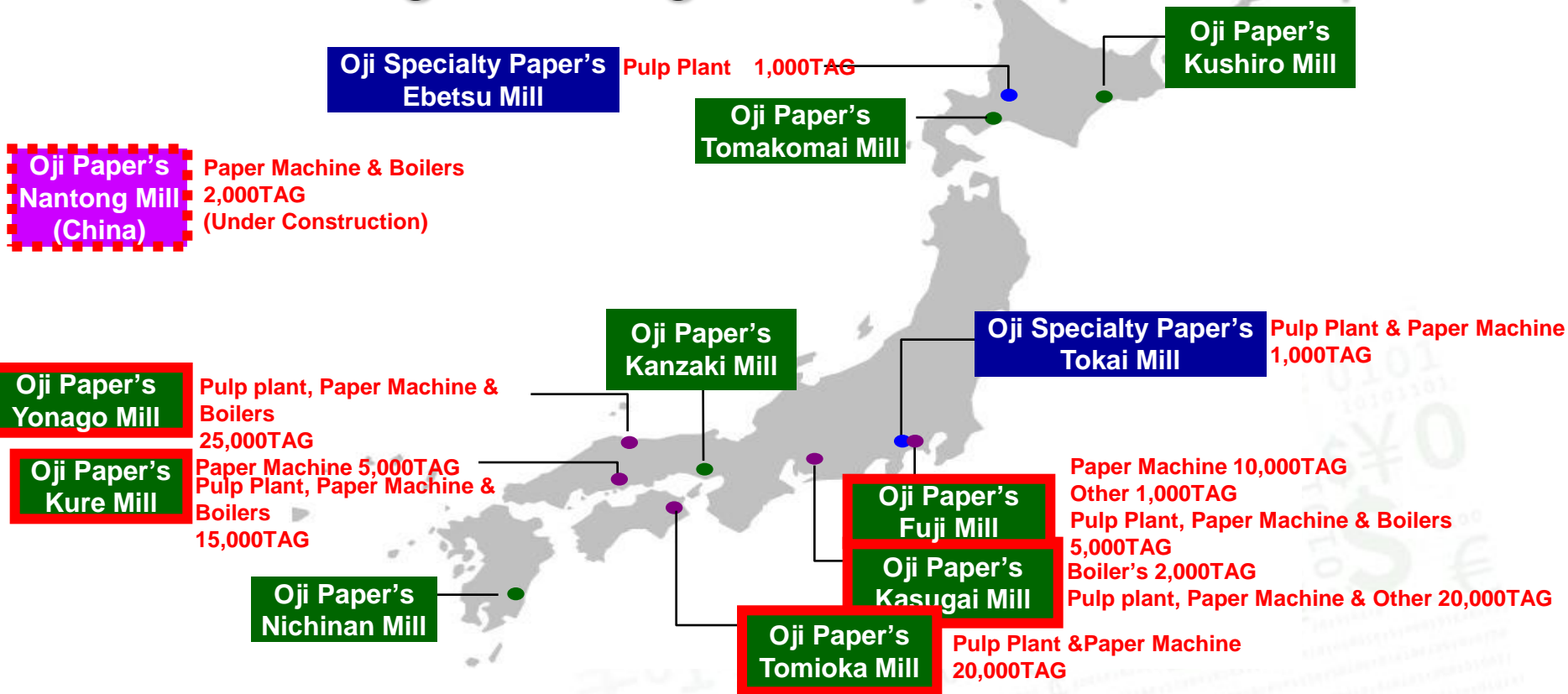
7. Finish :
Roll conversion
Flat conversion



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PI Usage throughout Oji Paper Group



History of PI Deployment at Major Mills

Installed	Mill	Objectives	Overview
Mar. 2000	Kure	Machine operation analysis (PI as the first PIMS)	Installed on existing paper machine to analyze broken paper ※2,000TAGS
Oct. 2001	Fuji	Operation support system development for New machines (PI as the first PIMS)	Installed on new machine to support consolidated operation (preparation ~ finish) Presented at PI UC in Japan. ※16,000 TAGS
Aug. 2005	Kasugai	Power equipment report & analysis system renovation (Replace Hitachi report system)	Replaced existing system with PI to analyze operation ※2,000TAGS
Dec. 2006	Kasugai	Pulp information system renovation (Replace Fujitsu MES domain, PIMS area)	Installed PI (as PIMS) on area built w/ existing comp system to manage performance & to analyze operation ※20,000TAGS
May 2008	Ebetsu (Oji-Sp)	Pulp Operation Analysis	After trial deployment at KP Plant, decision was made for permanent installation. ※1,000TAG
Nov. 2008	Tomioka Kure Yonago	Operation support system renovation Base operation data visualization and benchmark data management (T: New PI, K: Replace ASPEN, Y: Replace Toshiba)	Utilize PI as de facto standard of PIMS; Bundled package contract to install PI in all 3 mills ※60,000TAGS
Oct. 2009	Tokai (Oji-Sp)	Machine Operation Analysis Support (Operation cost reduction by KPI Visualization)	Improved operation performance by benchmarking operation cost and trend monitoring using KPI visualization ※2,000TAG

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Case Example

Oji Paper Co., Ltd. (Fuji Mill)

<Objectives of PI Introduction>

- High Quality, Small Lots, Short-Delivery Order Intake
 - Need for a control system that communicates directly w/ the info. system
 - Need for consolidated operation control system – from pulp manufacturing stage through downstream stage

<Functions>

- Operation & Quality Data Management by Reel
 - Provide reel quality info. in finishing stage
 - Production history management (Data stored for 1 year)
 - Collection & management of test data

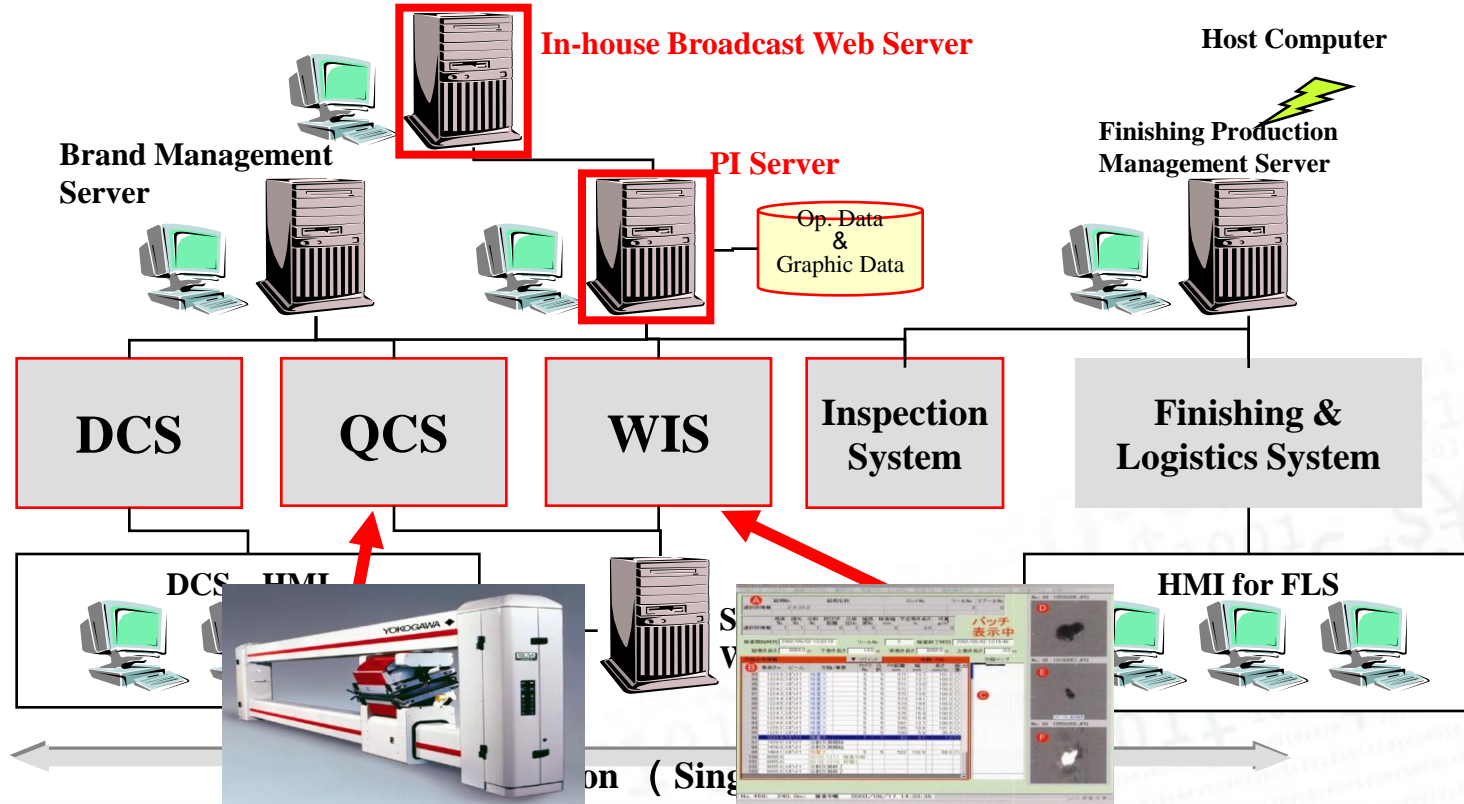
<PIMS Selection Criteria>

- ✓ Ease of user's display creation
- ✓ Ease of cut & paste of trend display as a st'd feature
- ✓ Ease of data read-in to Excel
- ✓ Ease of data analysis & editing
- ✓ Ease of connections to paper mill-specific instruments.
- ✓ Proven records from Pulp & Paper applications

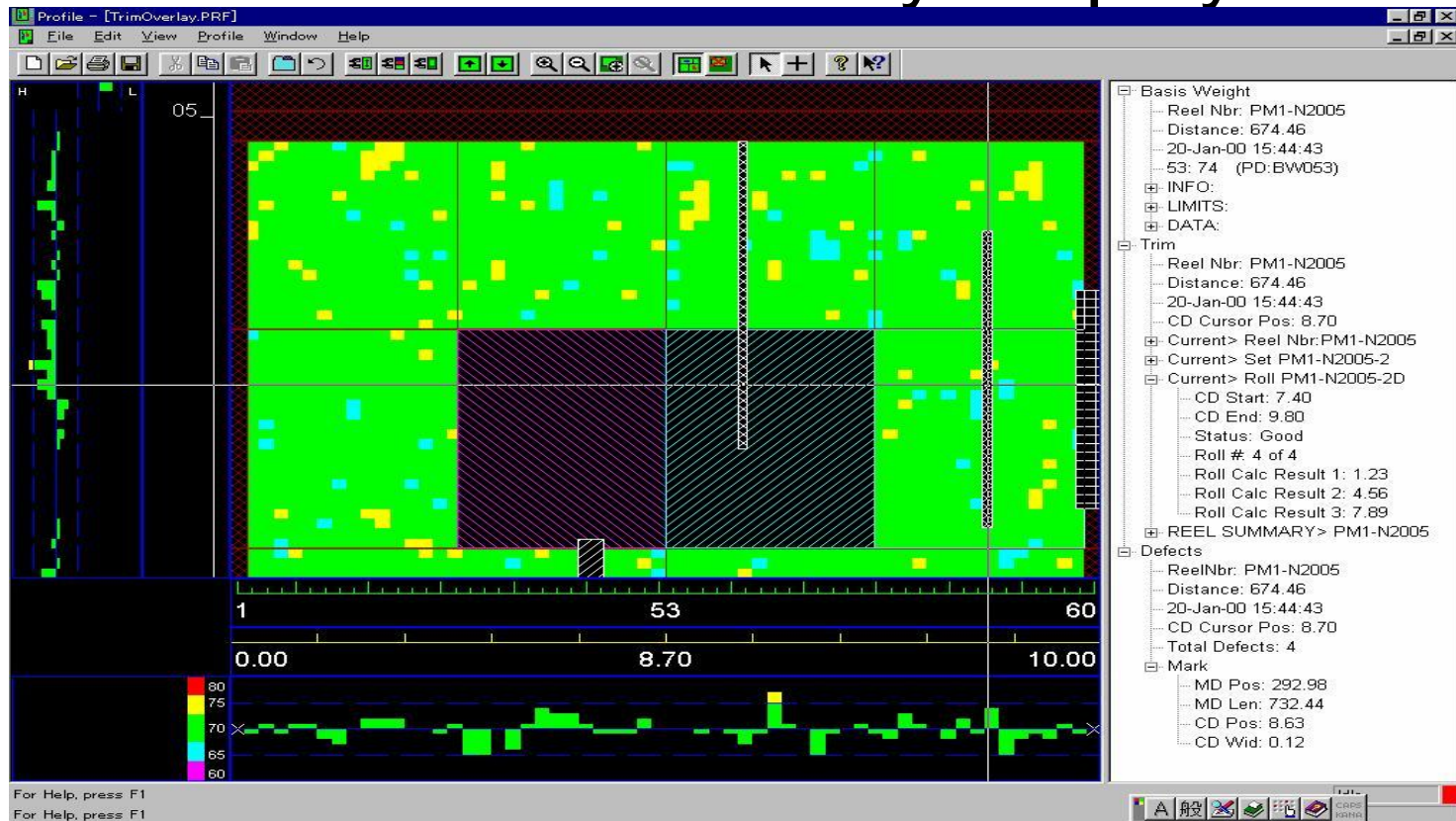


System Configuration at Fuji Mill

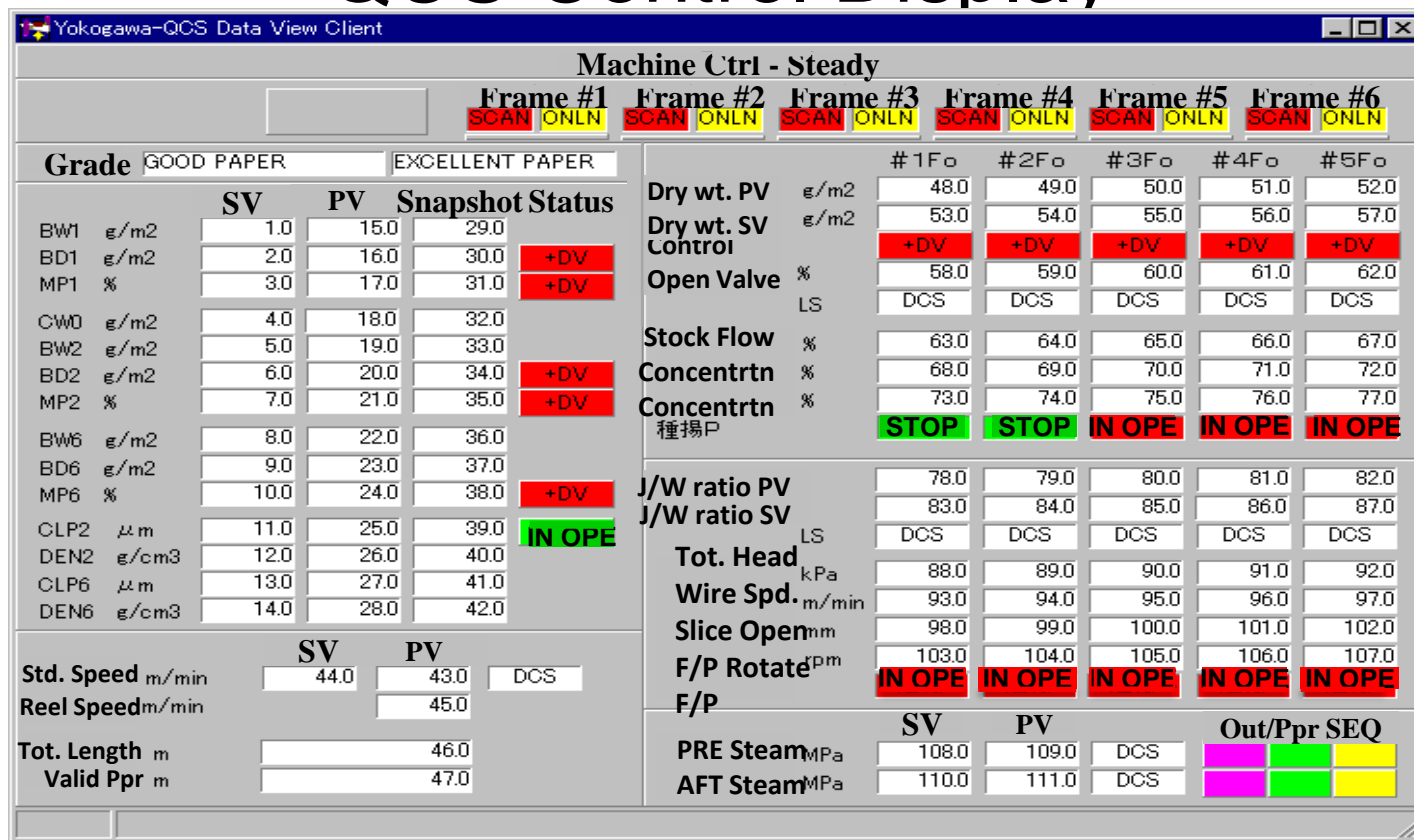
Vertical Integration (Info. Sharing by PIMS)



QCS / WIS Overlay Display



QCS Control Display



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Case Example: Kasugai Mill

<PI Implementation: Purpose & Aim>

- Centralized management of pulp manufacture process data
 - Renewal of existing system
 - Effective utilization of existing Excel report format(Feed into PI)
 - Eventual cost reduction through company-made reports

- Effects of PI implementation
 - Reference to process data of different DCS's in 1 display
 - Ease of creating trends & reports by department
 - Reduction of report function cost
 - Ease of retrieving & reusing past data
 - Save time through simplified data analysis & thus trouble analysis

Pulp Information system Kasugai Mill

PIMS/PI (20,000TAG) OSIssoft/YOKOGAWA



Kasugai Mill / Process Operation Status Display

Process Operation Status

Last Update 2009/10/10 10:05

	Op.Status	Op.Data	Unit
1D IV	IN OPE	999.9	RPM
1D Wooden Pot	IN OPE	999.9	ADT/D
1D PDW	IN OPE		
1D DW	IN OPE		
1D Screen	IN OPE		
NO2	IN OPE	999.9	ADT/H
PSA	IN OPE	999.9	T/D
1K	IN OPE	999.9	T/H
1C	IN OPE	999.9	M3/H
1EV	IN OPE	999.9	M3/H
4D L1 Stuffing	IN OPE	999.9	RPM
4D L2 Stuffing	IN OPE	999.9	RPM
4D Digester	IN OPE	999.9	ADT/D
4D L1 Cleaning	IN OPE		
4D L2 Cleaning	IN OPE		
4D DW	IN OPE		
LO2	IN OPE	999.9	ADT/H
3K	IN OPE	999.9	T/H
3C	OCS	0.0	M3/H
4EV	OCS	0.0	M3/H

	Op.Status	Op.Data	Unit	Op.Data	Unit
DIP L1	OCS	0	ADT/D	0.0	ADT/H
DIP L2	IN OPE	999	ADT/D	99.9	ADT/H
DIP L3	IN OPE	999	ADT/D		
3BL Receiving	IN OPE	999	ADT/D		
4BL Receiving	IN OPE	999	ADT/D		
4M/C	OCS	0	M/MIN	0.0	ADT/H
5M/C	IN OPE	999	M/MIN	99.9	ADT/H
6M/C	IN OPE	999	M/MIN	99.9	ADT/H
7M/C	IN OPE	999	M/MIN	99.9	ADT/H
8M/C	IN OPE	999	M/MIN	99.9	ADT/H
9M/C	IN OPE	999	M/MIN	99.9	ADT/H
10M/C	IN OPE	999	M/MIN	99.9	ADT/H
T1M/C	IN OPE				
T2M/C	OCS				
T3M/C	IN OPE				
T4M/C	OCS				

Update Data

Kasugai Mill / Water Usage Display

Water Usage by Department

Last Update 2009/10/10 10:05

(Unit: M3/H)

Process	Target	Snapshot	Average
1D	999	999.9	999.9
4D	999	999.9	999.9
Bleached	999	999.9	999.9
DIP	999	999.9	999.9
1 Adjustmnt	999	999.9	999.9
10 Adjustmnt	999	999.9	999.9
Machine 4	999	999.9	999.9
Machine 5	999	999.9	999.9
Machine 6	999	999.9	999.9
Machine 10	999	999.9	999.9

Process	Wtr Level	Low Limit	Lowest
Receiving we	99.9	99.9	99.9
Steam 1 well			
Steam 2 well	99.9	99.9	99.9
7, 8 M well	99.9		
T-M/C well	99.9		

Process	Target	Snapshot	Average
Coating 1, 2	999	999.9	999.9
Coating 3	999	999.9	999.9
2 Adjustmnt	999	999.9	999.9
Machine 7, 8	999	999.9	999.9
Machine 9	999	999.9	999.9
Machine T1,	999	999.9	999.9
Machine T3	999	999.9	999.9
Machine T4	999	999.9	999.9
Wtr Qlty Ctrl	999	999.9	999.9
Co Housng	999	999.9	999.9
Steam Pwr	999	999.9	999.9
Mill Total	9999	9999.9	9999.9

Update Data

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Case Example

PI Deployment at Oji Paper's 3 Mills

- Mill Operation Control System Renovations -

<Background>

- Aging Operation Control System (OCS) must be replaced.
- New OCS should cover Pulp Milling, Paper Machines and Utilities and integrate all process data in each plant consistently.

<Objectives>

- Consolidate all process data by each Mill and standardize data management.
- Consolidate all process data by Pulp, Paper and Utility facilities in each Mill.
- Utilize data to keep track of operations and create Daily/Monthly reports.
- Provide data to Operation Control System.
- Unify code numbering structure, external interfaces, terminology, infrastructure and operation management.

Case Example

PI Deployment at Oji Paper's 3 Mills

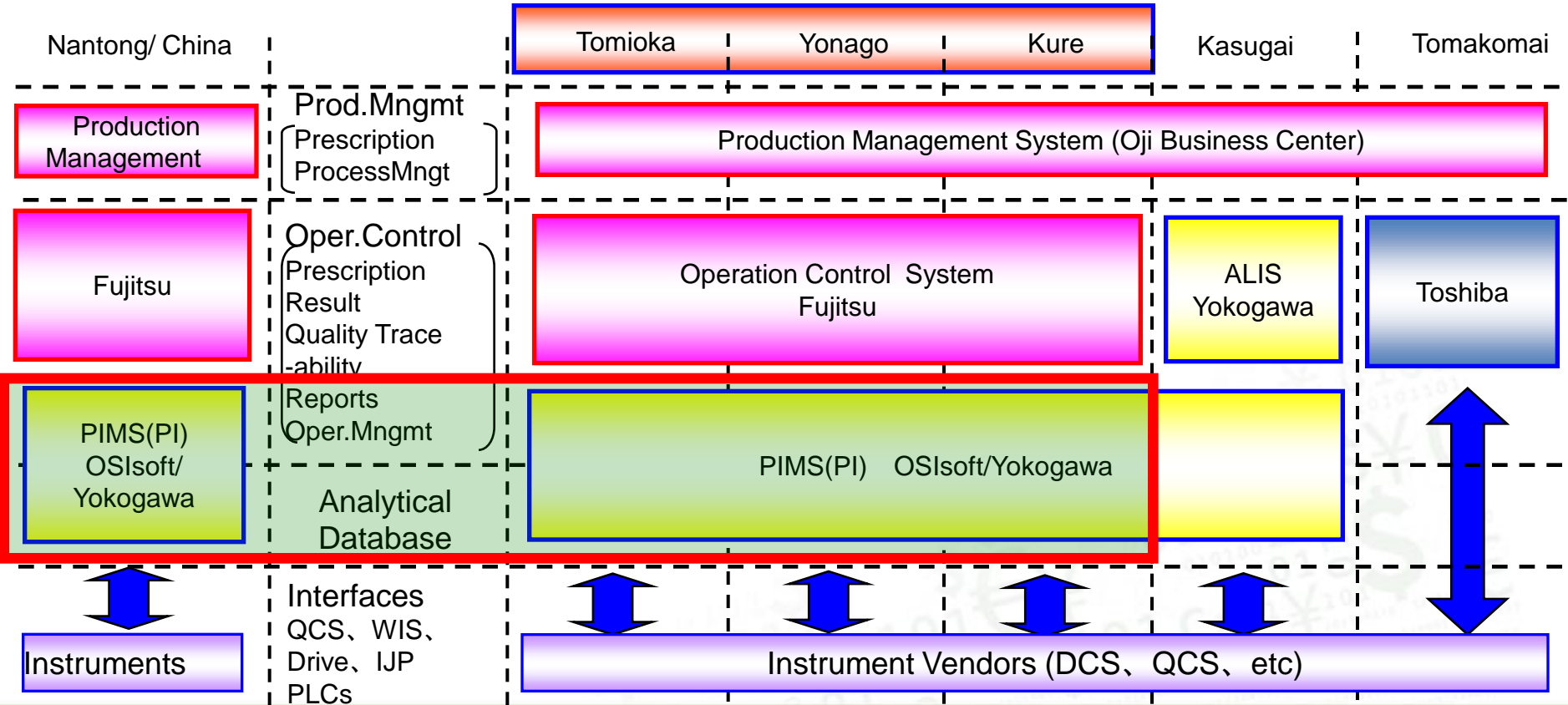
<Issues to Be Addressed>

- Conventional database can hardly keep up with OS updates.
- Renewal is costly.
(Each hardware replacement imposes verification cost of applications)
- Interfaces differ by facility depending on DCS (Extra cost) .
- Data crucial for managing quality & cost are not consistently collected.

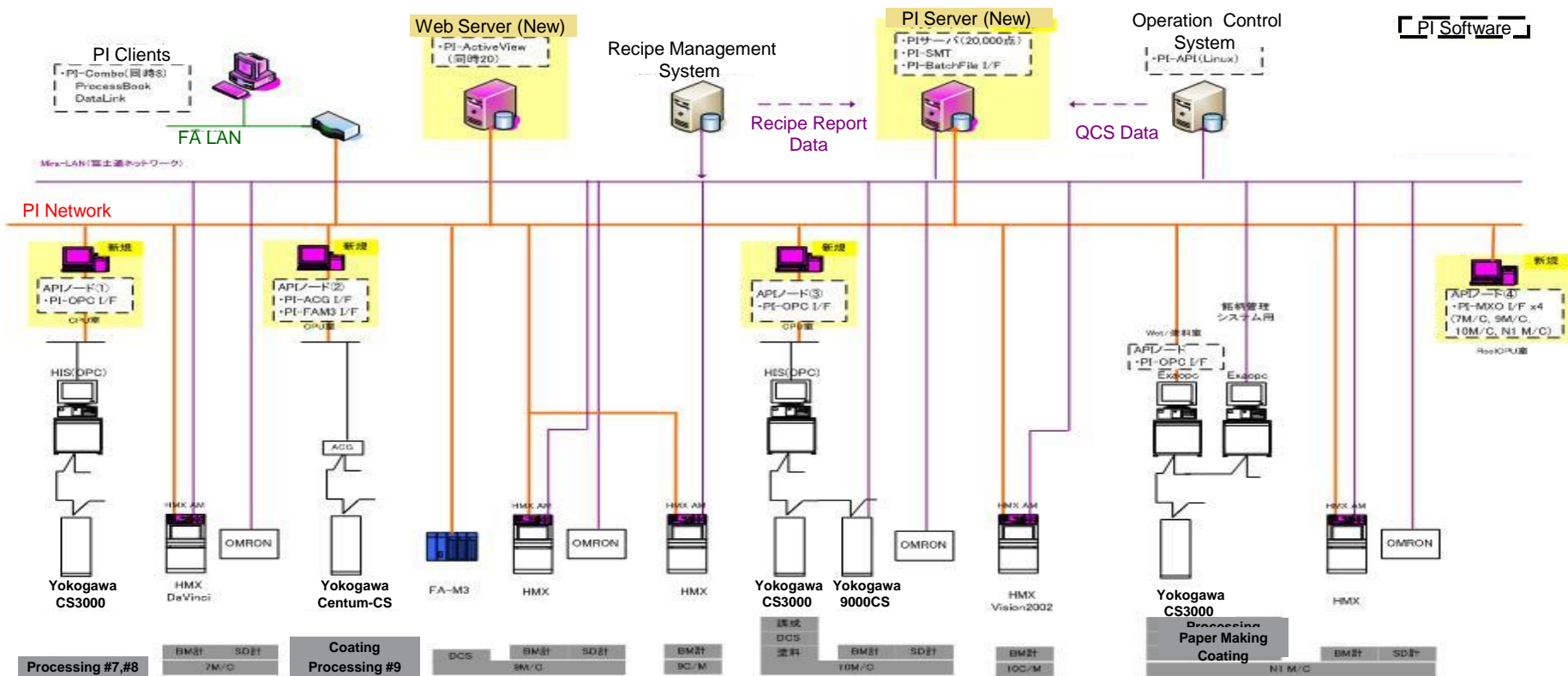
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- Ease of end-user's display creation
- Ease of data read-in to Excel
- Ease of data analysis & editing
- Ease of connections to paper mill-specific instruments.
- Proven records from Pulp & Paper applications
- Ease of data exchange with other OCSs

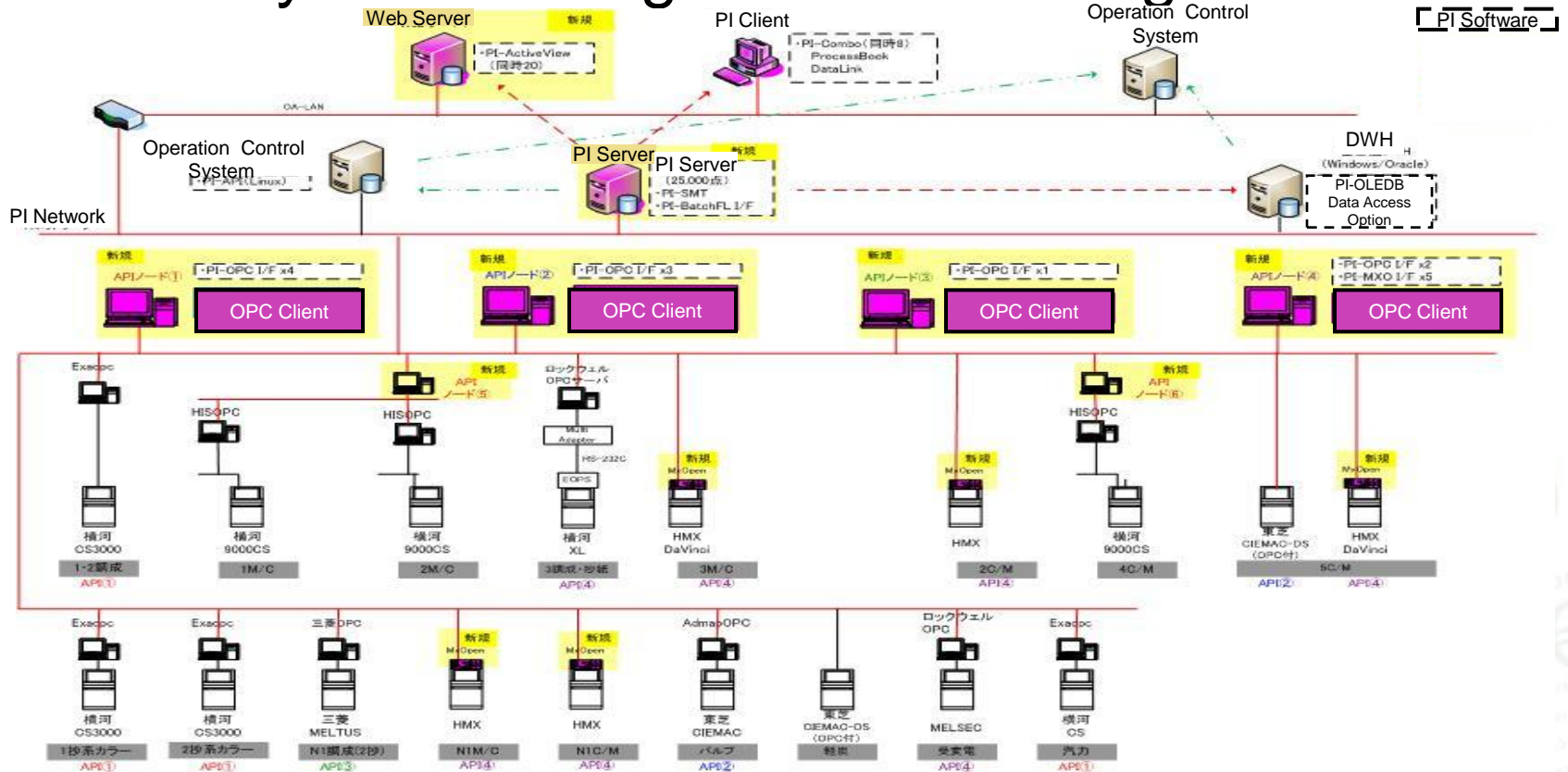
PI Positioning at Major Mills of Oji Paper



System Configuration at Tomioka Mill

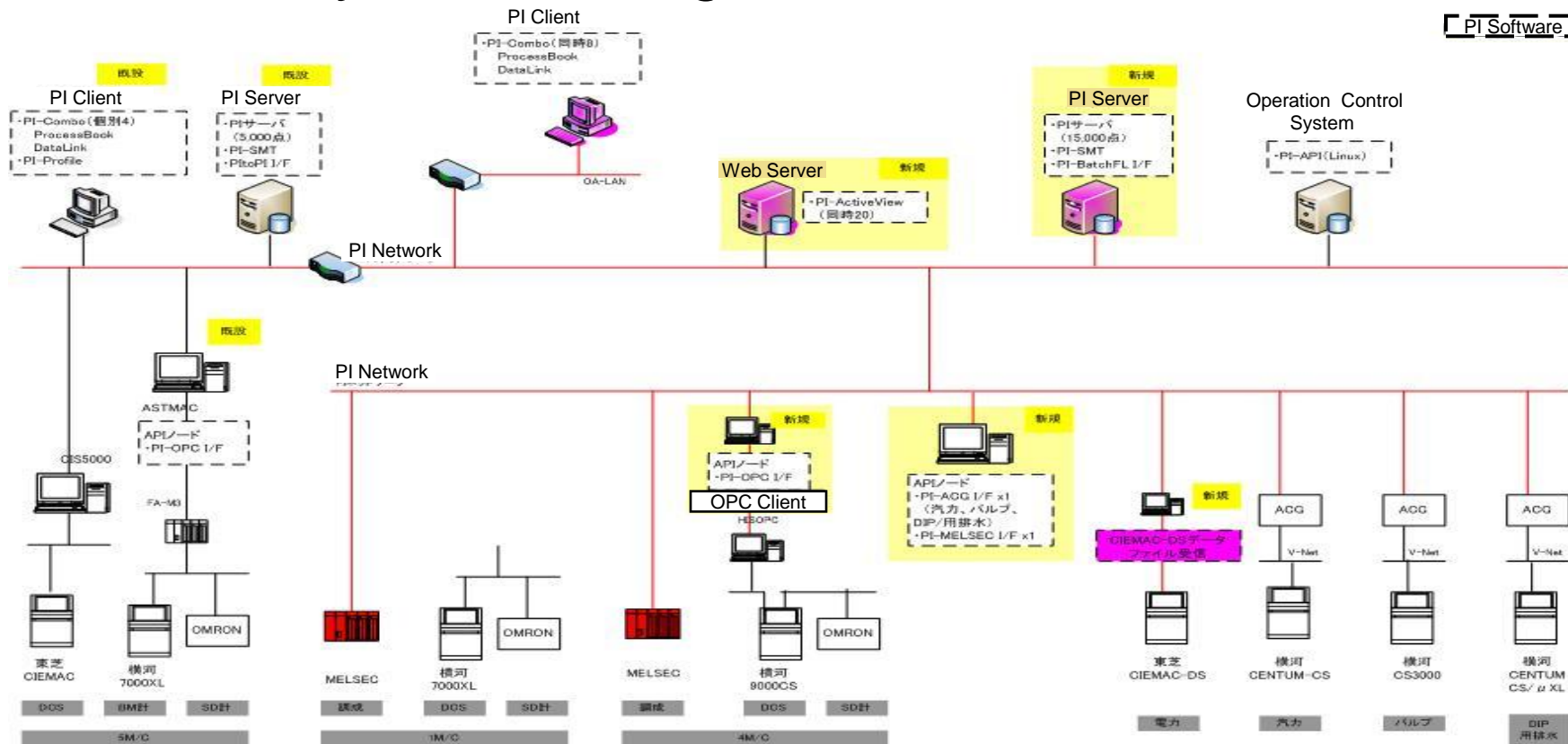


System Configuration at Yonago Mill

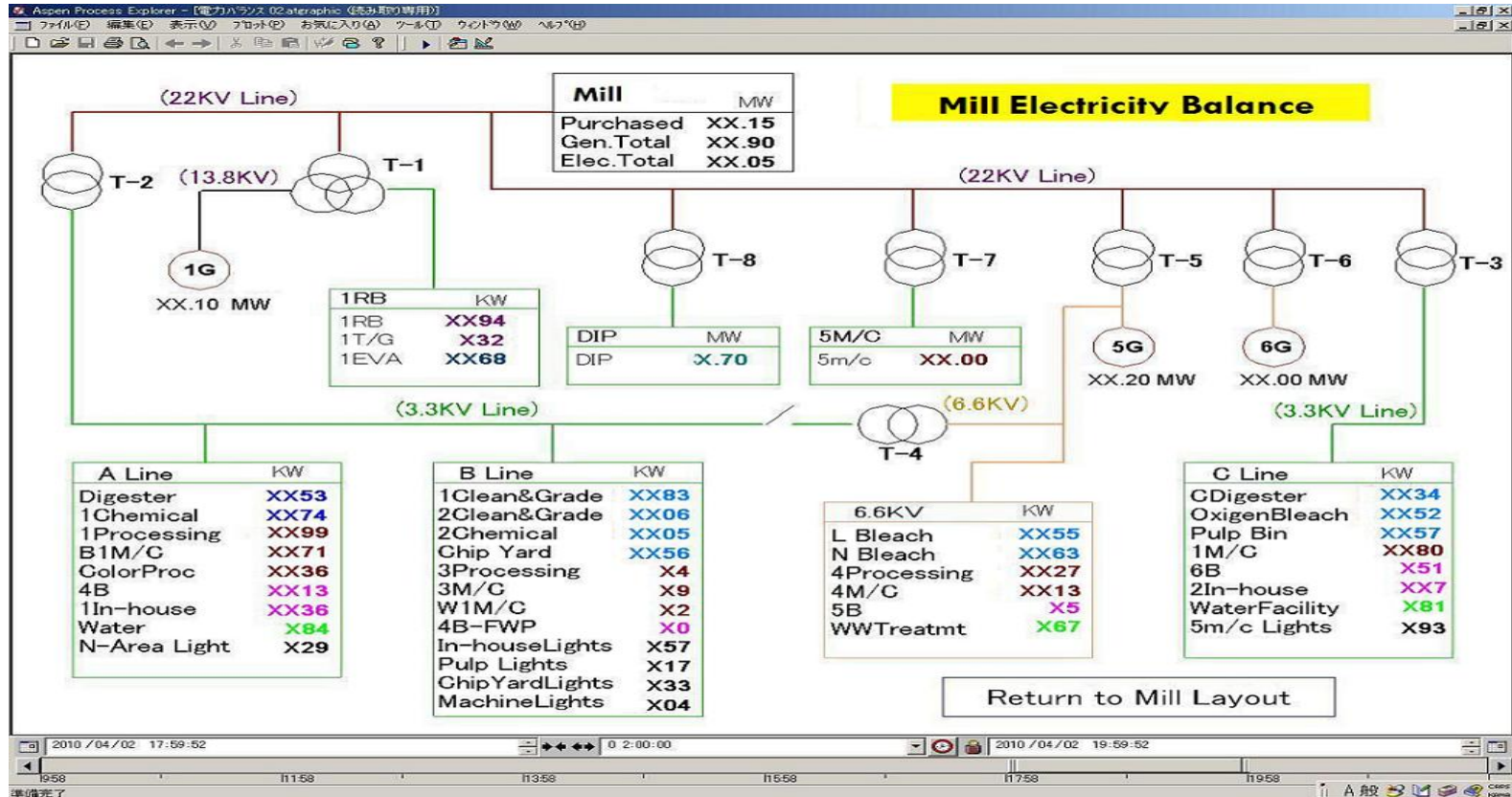


System Configuration at Kure Mill

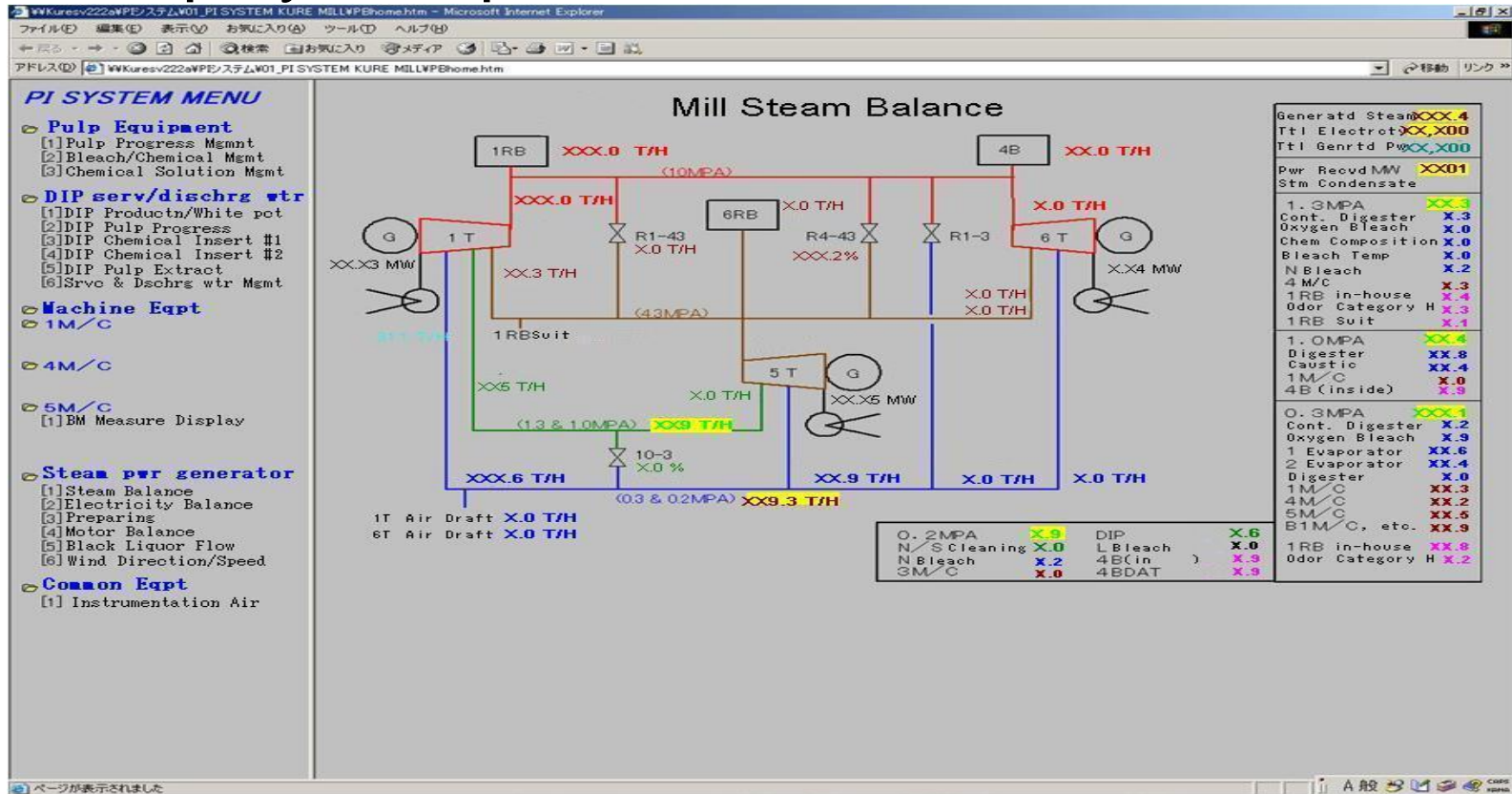
PI Software



Display Sample 1 / Electricity Balance Monitor



Display Sample 2 / Steam Balance Monitor



PI License Used

- PI Enterprise Server
- PI OPC DA Interface
- PI Measurex HMX/ODX/MXOpen Interface
- PI COMBO (ProcessBook, DataLink)
- PI ActiveView
- PI API / PI OLEDB

Same PI components at Tomioka, Yonago and Kure Mills

Benefits of PI and Next Steps

<Benefits>

- Reference multiple machine data in single display
- Reduced cost for maintenance, analysis, reports by EUC
- Reduced cost for system building

<Next Steps>

- Enhance quality traceability by leveraging PI capability
- Enhance unit cost management in real-time

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Case Example

Oji Specialty Paper Co., Ltd. (Tokai Mill)

- Cost reduction by utilizing “Real-time Unit Cost Display System” -

<Issues and objectives of PI introduction>

- Reduce material/energy cost & improve yield rate through real-time visualization of production status & optimized operation under the circumstances of small lots, many grades and low machine operation)
- Improve time efficiency (=cost reduction) through automated daily reports & decreased operator load

High-Mix Low-Volume

Little awareness of specific production cost

Energy Loss

Smaller lots but full energy usage
(esp. electricity)

Challenges

Fluctuation of Variable Cost & Yield Rate*

Cost-optimized manufacturing pattern yet to be established

*Causes production variance and affects to product price decision

Extra Man-hour Cost and Work Load

Hand-written Daily report

Real-Time Operation Progress Display (Proto)

★View by Brand

★Show Cost (Cost Awareness)

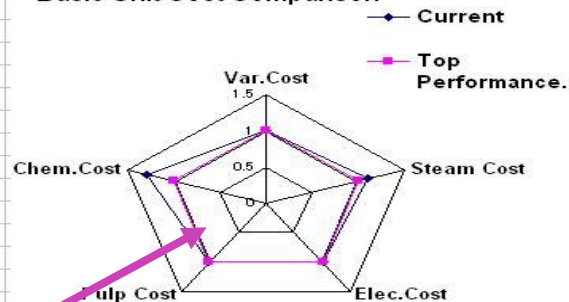
Fujinomiya B-2M/C Operation			Date	2009/1/21 5:00	
Brand Data					
Brand Name	Wood Shaving Paper(A)R	Basis Weight	701 g/m3	Var.Cost	77.7 Yen/kg
Brand No.	030				
** Brand	Wood Shaving Paper A	Basis Weight	g/m2	**Var.Cost	73.26 Yen/kg
		Machine Speed	46 m/min	**Trim Width	2,660 mm
		Reel Basis Wt	590.8 g/m2		
		Reel Moisture	8.1 %		
		BM Speed	56.4 m/min	BM Trim Width	2,559 mm
		Steam Usage	8.25 t/h	Steam Cost	0.1 Yen/kg
		Elec. Usage	798.6 kWh/t	Elec.Cost	2.1 Yen/kg
				Pulp Cost	69.0 Yen/kg
				Chem.Cost	5.6 Yen/kg

Basic Unit Cost Comparison

◆ Current
■ Top Performance.

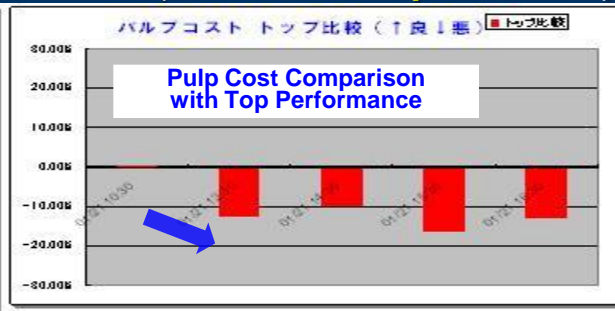
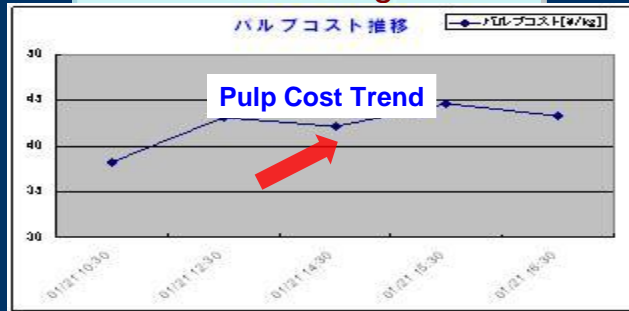
Category	Current	Top Performance
Var.Cost	77.7	73.26
Steam Cost	0.1	0.1
Elec.Cost	2.1	2.1
Pulp Cost	69.0	69.0
Chem.Cost	5.6	5.6

Basic Unit Cost Comparison



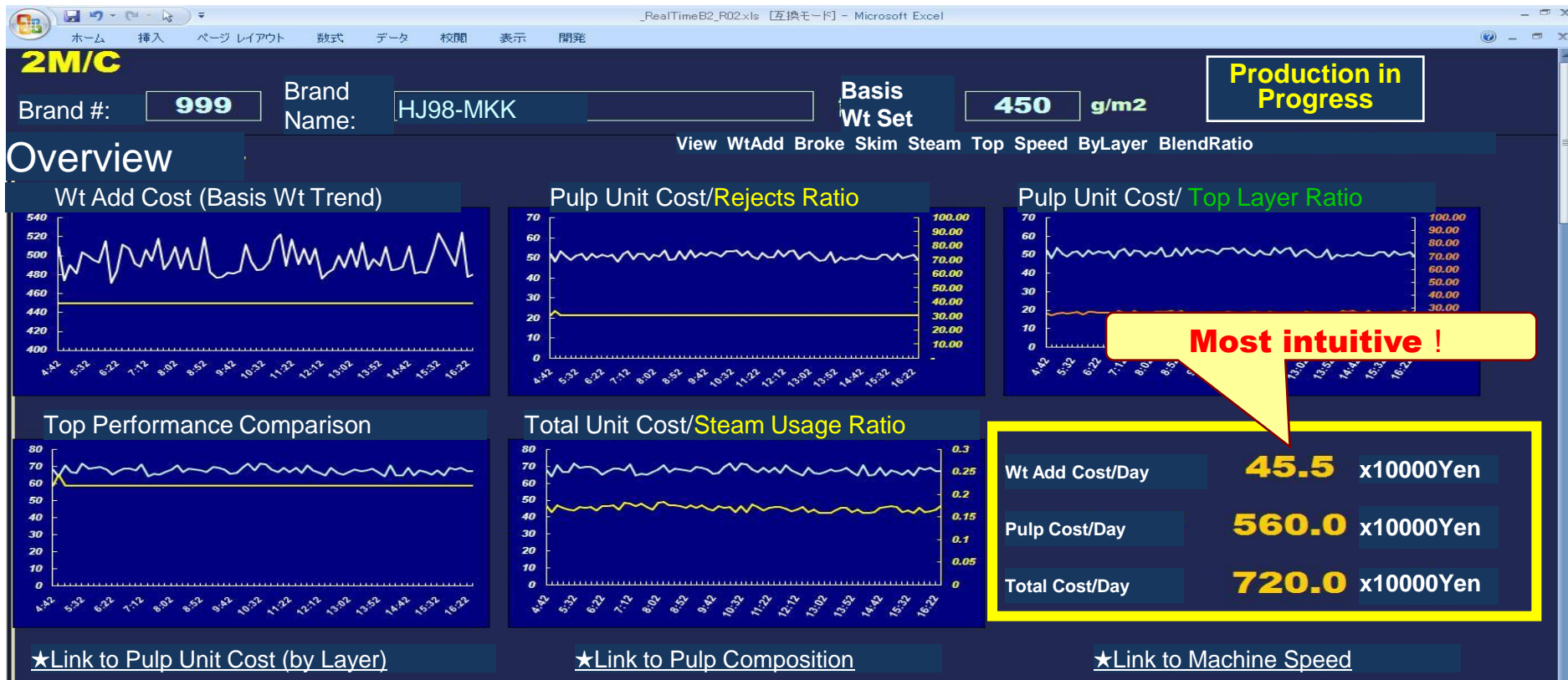
Real-Time Cost Trend Monitoring

★Comparison with Top Performance (Conscious Improvement)



★Monitor Rejection %, Stock Blending %, Density & Flow Variation → Action for Improvement

Paper Machine Overview / Visualization



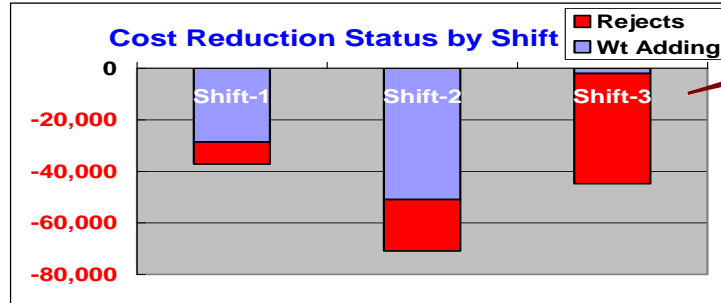
Effect Confirmation Daily Report

■ B1 M/C Cost Visualization Report

Date 2009 11 3 Begin 2009/11/3
End 2009/11/4

■ Data by Shift

Shift	Cost Reduction Amount (Yen)		
	Wt Adding	Rejects	Total
Shift-1	-28,678	-8,518	-37,196
Shift-2	-50,945	-19,959	-70,904
Shift-3	-2,033	-42,785	-44,818
Total	-81,656	-71,262	-152,918



Point 1

■ Data by Shift, by Grade (Cost Reduction Target Items)

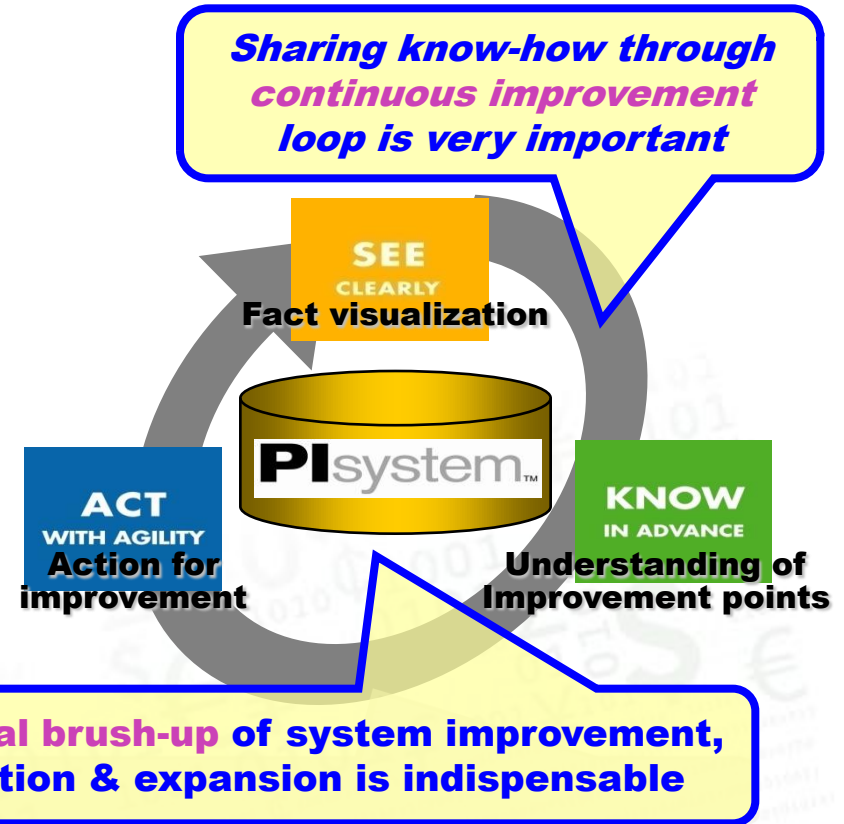
Shift	Grade No.	Grade	Basis Wt	Good Item Begin		Good Item End		Weight Addition (g/m2)						Broke Blending Ratio					
				H	M	H	M	Basis Wt Setting	Past Avg Basis Wt	Target Basis Wt	Actual Basis Wt	Telesis Mark	Actual - Past Avg	Reduction (Yen)	Past Avg (%)	Target (%)	Actual (%)	Telesis Mark	Reduction (Yen)
Shift-1	720	New Vision	310	09	45			310	341.8	341.0	335.3	◎	-6.0	-28,678	35.6	30.0	35.0	◎	-8,518
Shift-2	720	New Vision	310			21	35	310	341.8	341.0	368.2		26.9	0	35.6	30.0	35.2	◎	-18,213
	720	New Vision	350	14	58			350	377.9	377.0	370.9	◎	-7.0	-50,945	23.9	35.0	35.5	◎	-1,746
Shift-3	720	New Vision	350			21	35	350	377.9	377.0	520.6		142.7	0	23.9	35.0	37.3	◎	-31,625
	730	WP NewVision	350	02	50			350	375.2	375.0	389.6		14.4	0	21.6	35.0	40.0	◎	-8,268
	730	WP NewVision	400					400	427.1	427.0	425.1	◎	-2.3	-2,033	0.0	35.0	35.0	◎	-2,892

Point 3

Point 2

Future Prospects

- Continual activities for improvement and sharing know-how
 - Sustained cost-conscious operations
 - Implementation of measures for promoting KAIZEN notebook entry
- Improvement/Utilization/Expansion
 - Improvement of accuracy for cost understanding
 - Boosting yield
 - Chest residue calculation and display
 - Regulation compliance and laborsaving
 - Calculation for waste paper blending ratio
- Cost DB establishment
 - Development for other mills
 - System construction that enables wide-area deployment



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Efforts for Enhancement of Business Competitiveness

- Visualization of management info and speeding up of PDCA cycle
 - ✓ Support for agile decision making by provision of integrated management info and KPI
 - ✓ Early grasp on accurate performance results and feedbacks to production planning
 - ✓ Cost reduction and efficiency improvement at corporate level

- Plant wide establishment of advanced informatization and PDCA cycle
 - ✓ Viable production planning and instruction issuance
 - ✓ Automatic collection of production performance data and sending consistent data to ERP
 - ✓ Speeding up, visualization and upgrading of plant management work

Factory/Mill

Corporate

Department

- Visualization of plant operation info
 - ✓ More efficient plant operation management work
 - ✓ Automatic plant data collection
 - ✓ Automatic quality analysis data collection





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Thank you

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