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# Finding “The Sweet Spot” in the Paper Mill

Presented by **Kristi Kobetich, Port Townsend Paper Corporation**  
**Rob Chandler, Casne Engineering Inc**

# Agenda

- Introductions
- Background: History, Challenges, and Goals
- Centerline Proof of Concept
- Simplified Architecture
- The Results
- Next Steps

# Casne Engineering, Inc

- OSIssoft Integration Partner
  - Professional Engineering
  - Control Systems
  - Technology Integration
  - Support desk services
- Utilities, Process Industries, Data Centers
- 30+ year track record



# Port Townsend Paper Corporation



- Overview

- Located in Port Townsend, WA
- 280 employees
- Produce unbleached Kraft paper, containerboard & market pulp
- 300,000 tons per year





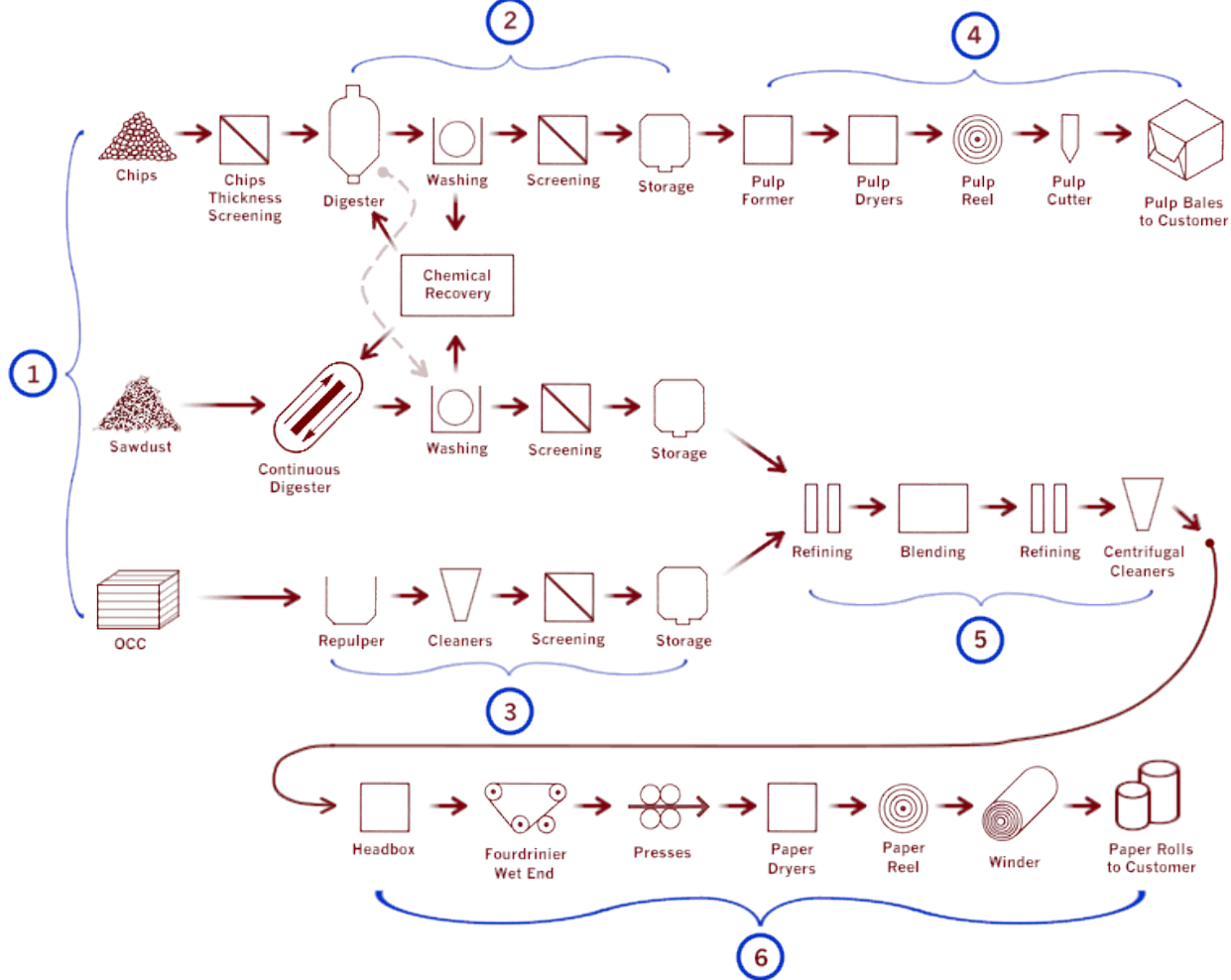
# Port Townsend Paper Corporation

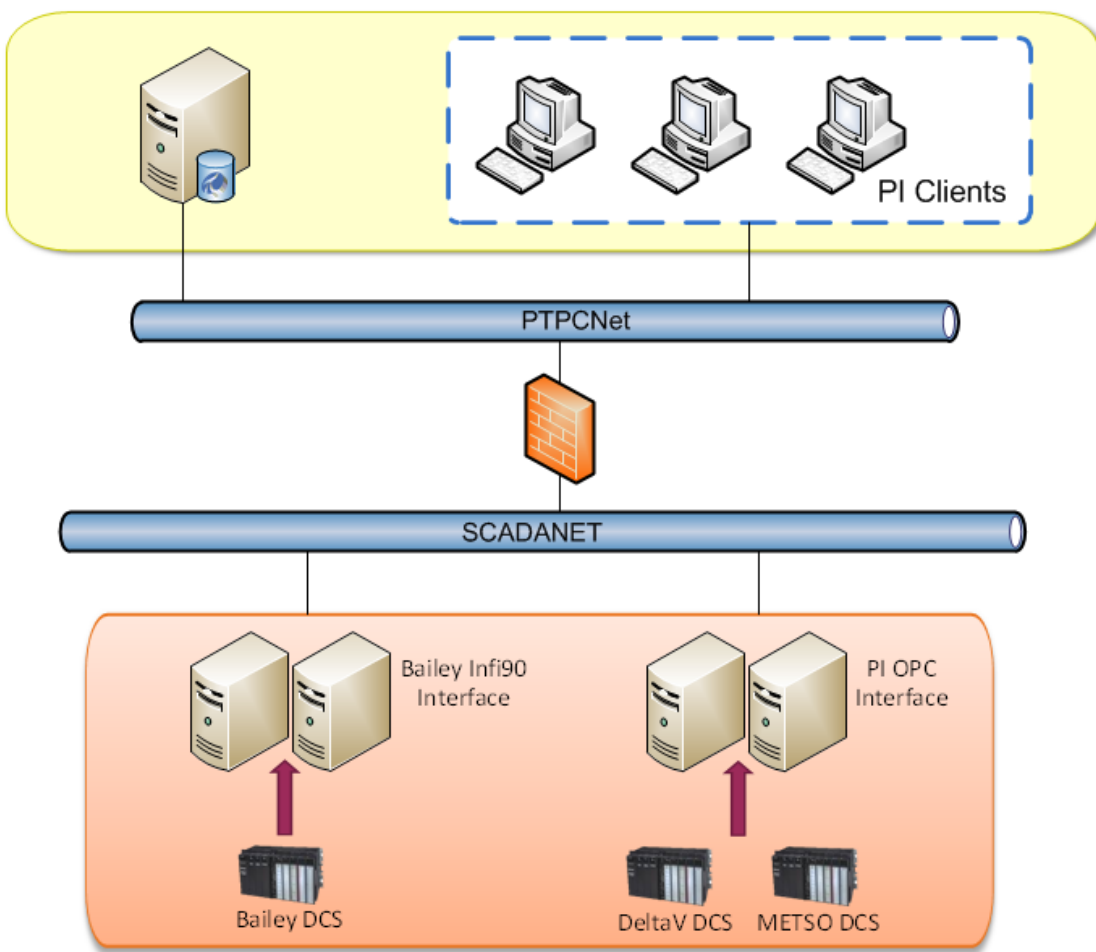
- Products & Markets
  - Kraft pulp & paper
  - Containerboard
  - Specialty products
- Blend of both virgin and recycled fibers
- Northwest softwood chips and sawdust
- Sister facility Crown Packaging in British Columbia





# Process





# Our PI System

PI Enterprise Server

- 5000 Tags
- Advanced Server Pack
- Data Access Pack

PI Bailey Infi90 Interface to BAILEY DCS (PM#1, Pulp Mil)

PI OPC Interface to METSO DCS (PM#2, OCC)

PI OPC Interface to DeltaV DCS (Boiler)

PI ProcessBook and PI DataLink (70 users)

PI SQC Client

PI Profile View



Click on links below to navigate through PI ProcessBooks and Reports  
Some of these links are in protected folders. Unless you have the proper permissions, you may not be able to open these files.

MILL ADMINISTRATIVE

- Pulp Mill Status Sheet
- Paper Machine Schedules
- Paper Machine Summaries & Downtime Reports
- Paper QC & Shipping Specifications

#1 PAPER MACHINE

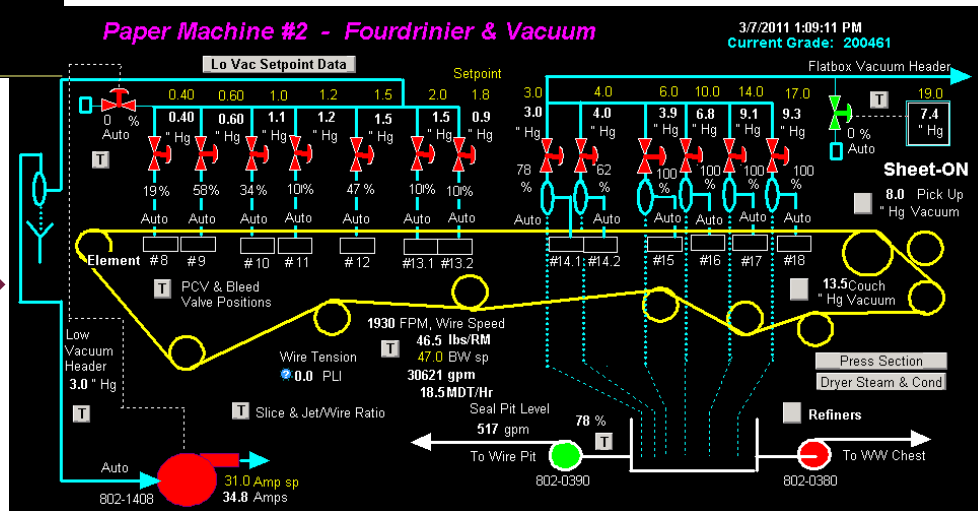
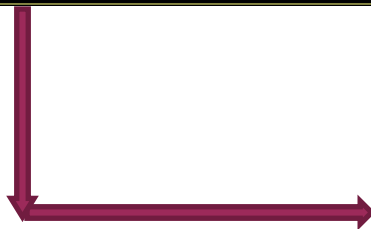
- No 1 Paper Machine Key Trends
- No 1 Paper Machine Process Flow Diagram

LINKS

- SWITCHBOARD
- PULP MILL SWITCHBOARD

# “Switchboard” PI ProcessBook Displays

- Used for Process Visualization



# Product Quality Challenges

- Variation in raw material from batch to batch
- Multitude of machine setting changes between paper grades
- Variation in operator judgment
- Long periods of time between similar product runs

# Centerline Proof of Concept

- Goals
  - Streamline QC data entry
  - Single source for quality and process targets
  - Get process information into the hands of the operators
  - Improve visibility & access to historical process information
  - Timely access to past quality and performance data
  - Quick and easy comparison of real time production data to historical performance data
  - Ability to communicate reasons for “off-spec” events

# Solution

- Two Applications
  - Data Entry Application
    - Collection of quality test results
    - Uploading into the PI System
  - Process Dashboard
    - Displaying current and historic Process, Quality & Economic Information compared to targets
    - Provide access to Action Trees & Event Notes

# QC Data Entry via the PI System

- Used to send quality data to PI for long term storage and use
- Microsoft Excel + PI DataLink = Operator familiarity
- Utilizes existing software licenses
- **Simple**, flexible, maintainable solution

Microsoft Excel - PTPC\_Data Sheet PM#1 Ver2.11.xls

File Edit View Insert Format Tools Data Window PI PI-SMT Help

M22

Data Entry: Paper Machine Number #1						Validation
Grade:		3/4/11 14:49		Grade:	1500	
Sample Time:		Clear Form		Reel TurnUp Time:	9/7/10 13:00	
Reel Number:				Reel Number:	99a	
PI tag	Test	Unit			Avg	
BRIGHTNESS:mi.pm1	Brightness					
BVALUE:mi.pm1	Value					

1. Enter Grade using the pull down list.  
2. Enter Sample Time using the format 7/23/2010 16:00.  
3. Enter the Reel Number. For YB this may be 1a or 1b.  
4. Enter the Brightness and b Value from the ColorTouch.  
5. Use the "Upload to PI" button when finished entering data.

Upload to PI Refresh

# Process Dashboard

Port Townsend Paper Company  
Process Dashboard - Paper Machine #2

Selected Grade: 502401 B40 Discovery Kraft  V 3.3  
502401

Quality

Run Specifications					Most Recent Run				Previous Run		2nd Previous Run		
SQC					Start:	3/9/2011 23:32			2/18/2011 7:18		1/31/2011 20:47		
					End	3/10/2011 1:51			2/18/2011 14:17		1/31/2011 23:28		
					Duration	2:19:32			6:58:59		2:41:48		
Item	Unit	Reject Low	Target	Reject High	Latest Value	Ave	2s	CC	Add Help Note	Ave	2s	Ave	2s
Mullen	psi	16.0	20.0		28.7	28.7	-	<input type="checkbox"/>	<input type="checkbox"/>	25.1	3.2	23.4	1.7
CD STFI	lb/in				NA	-	-	<input type="checkbox"/>	<input type="checkbox"/>	-	-	-	-
Concora	lb				NA	-	-	<input type="checkbox"/>	<input type="checkbox"/>	-	-	-	-
MD Tear	grams	45	50		84	84	-	<input type="checkbox"/>	<input type="checkbox"/>	62	3	59	10
CD Tear	grams				118	118	-	<input type="checkbox"/>	<input type="checkbox"/>	85	2	77	20
Agg Tear	grams				202	-	-	<input type="checkbox"/>	<input type="checkbox"/>	147	3	135	20
MD Tensile	lb/in				NA	-	-	<input type="checkbox"/>	<input type="checkbox"/>	-	-	-	-
CD Tensile	lb/in				NA	-	-	<input type="checkbox"/>	<input type="checkbox"/>	-	-	-	-
MD Wet Tensile	lb/in				NA	-	-	<input type="checkbox"/>	<input type="checkbox"/>	-	-	-	-
CD Wet Tensile	lb/in							<input type="checkbox"/>	<input type="checkbox"/>	-	-	-	-
Caliper	mils							<input type="checkbox"/>	<input type="checkbox"/>	-	-	-	-
Densometer	sec/10							<input type="checkbox"/>	<input type="checkbox"/>	-	-	-	-
TS Smoothness	Sheffie							<input type="checkbox"/>	<input type="checkbox"/>	-	-	-	-
WS Smoothness	Sheffie							<input type="checkbox"/>	<input type="checkbox"/>	-	-	-	-
Ink Float	minute							<input type="checkbox"/>	<input type="checkbox"/>	-	-	-	-
TS Cobb	g/m2							<input type="checkbox"/>	<input type="checkbox"/>	-	-	-	-
WS Cobb	g/m2							<input type="checkbox"/>	<input type="checkbox"/>	-	-	-	-
Water Float	second							<input type="checkbox"/>	<input type="checkbox"/>	-	-	-	-

Enter an Event Note

Grade: 502401

Parameter Tag: MULLEN:mi.pm2 (Mullen)

Event time: 03/10/2011 01:45:00

Operator ID: \_\_\_\_\_

Note: \_\_\_\_\_

- Used by operators and managers
- Merge Data Streams
  - Quality
  - Process
  - Economic
- One-click Access to:
  - Operator notes
  - Quality Centerline charts
  - Action trees (future)

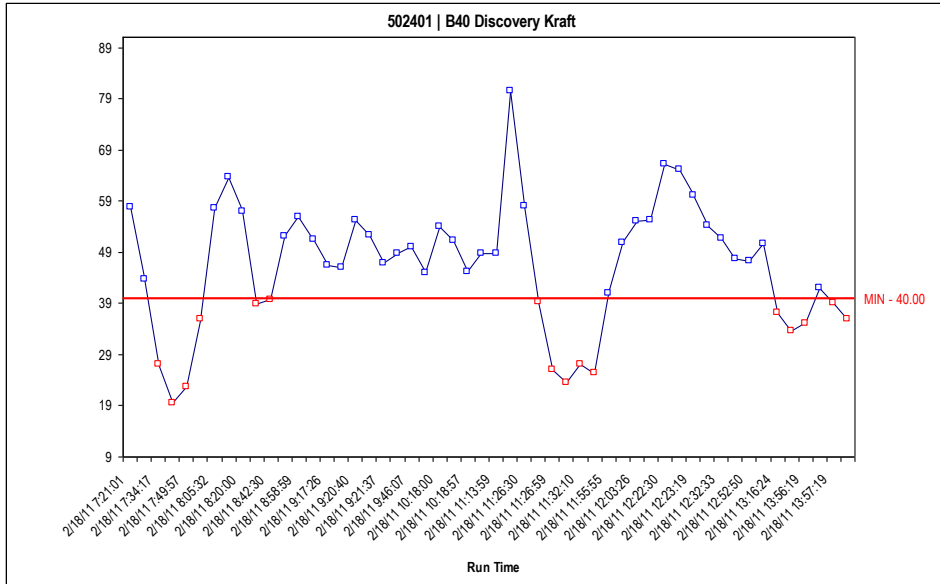
# Centerline Charts



- Data from PI Server brought into Excel Charts
- Quick and easy access to quality information for same-grade runs



# Centerline Charts



- Quick and easy access to Process data over time for a specific product grade
- Color Coded for Identifying Run Conditions
- Excel charts for consistent interface and easy use within reports

	A	B	C	D	E	F	G
1	Grade	Date	Quality/PI Tag	Min	Target	Max	
2	502331	11/07/08	Agg Tear				
3	502351	11/07/08	Agg Tear				
4	502381	02/09/09	Agg Tear				
5	502401	11/07/08	Agg Tear				
6	502451	11/07/08	Agg Tear				
7	502461	11/07/08	Agg Tear				
8	502501	11/07/08	Agg Tear				
9	502521	11/07/08	Agg Tear				
10	502551	11/07/08	Agg Tear				
11	502571	11/07/08	Agg Tear				
12	502601	11/07/08	Agg Tear				
13	502621	02/09/09	Agg Tear				
14	502631	11/07/08	Agg Tear				
15	502641	02/09/09	Agg Tear				

# Simplified Architecture

- Simple = Better
- Flexible
- User Familiarity
- Cost Effective
- Maintainable

Microsoft Excel - PTPC Process Dashboard PM#2.xls

File Edit View Insert Format Tools Data Window P1 PI-SMT Help

Calibri 11 B U I \$ % + 100%

C29 AI-563:av.pm2

Microsoft Visual Basic - PTPC Data Sheet PM#1 Ver2.11.xls [Sheet1 (Code)]

```

Private Sub btnDataEntry_Click()
Dim opConnection As New PTPCData.Connection
Dim strV As PTPCData.Server
Dim User As String
Dim Pwd As String
Dim dtocreationTime As Date
Dim intcol As Integer
Dim introw As Integer
Dim pitag As String
Dim pivote As String
Dim pivcol As String
Dim pivrow As String
Dim pivcol As String
Dim pivrow As String
Dim dttested As String
Dim dttested As String
Dim n As Integer
Dim i As Integer
On Error GoTo error_handler
'Get where to start updating tags
intcol = 4
introw = 7

```

NoteList-200501.xls [Read-Only] [Compatibility Mode] - Microsoft Excel

File Home Insert Page Layout Formulas Data Review View Developer

	A	B	C	D	E	F	G
1	Event Time	Grade	Parameter	Parameter PI Tag	Operator	Note	Note Entered
2	9/20/2010 18:11	200501	MD Tear	MDTEAR.mi.pm2	Laura	pressure spike, 15psi	9/20/10 18:59:57
3	9/20/2010 16:23	200501	MD Tensile	MDTENSILE.mi.pm2	Cindy	Pressure spike, 12psi	9/21/10 17:24:10
4	9/20/2010 15:56	200501	OCC %	OCC3_FURNISH.av.occ	Bill	Lost comms for 14seconds	9/21/10 16:45:48
5	9/20/2010 15:56	200501	Mullen	MULLEN.mi.pm2	Stan	power surge, 12%	9/20/10 16:36:50
6	9/20/2010 11:10	200501	C-Side Transfer	pe_avg_CSIDE_Frac.cal	Kevin	Secondary tank full	9/21/10 17:09:48
7	9/20/2010 10:18	200501	#2 Jones	WY-720.me.pm2	Bill	Comms restored	9/21/10 17:11:50
8	9/20/2010 10:18	200501	#2 Jones	WY-720.me.pm2	Bill	Lost comms	9/21/10 17:11:19
9	9/19/10 22:51:00	200501	Reel Speed	SI-456.av.pm2	Laura	pressure spike, 17psi	9/20/10 19:01:13

Sheet1 Sheet2 Sheet3

# Results

- Goals met
  - ✓ Streamlined QC data entry
  - ✓ Real time monitor for machine parameters and quality performance compared to targets
  - ✓ Improved visibility & access to historical process information
  - ✓ Timely access to past quality and performance data
  - ✓ Quick and easy comparison of real time production data to historical performance data
  - ✓ Ability to communicate reasons for “off-spec” events

# Results

- Tangible Benefits
  - Implementation is ongoing
  - Reduced product rejection rate
  - Standardized operating conditions
  - Improved communications amongst operators
  - Better understanding of “off-spec” events

# Next Steps

- Complete implementation
  - Operator hands on training in classroom
  - Utilize operator input to develop Action Trees and Centerline Targets
- Expand Economics tab
- Develop system for continuous updates

# Future Plans

- Integrate ABB Quality Management System with PI System
- Implement PI SQC
- Investigate PI Profile View
- Investigating Virtualizing our future upgrade to then PI 2010 architecture

# Questions

- Contact information

**Kristi Kobetich**  
Technical Services Manager



**PORT TOWNSEND PAPER CORPORATION**

100 Mill Road  
Port Townsend, WA 98368  
www.ptpc.com

Tel: 360-379-2081  
Fax: 360-379-2213  
KristiK@ptpc.com



**CASNE ENGINEERING, INC.**  
*Electrical and Technology Consultants*

**ROB CHANDLER**  
*Senior Software Integrator*

10604 NE 38<sup>th</sup> Place, Ste. 205  
Kirkland, WA 98033  
(425) 522-1000  
www.casne.com

Direct: (425) 522-1023  
rob.chandler@casne.com





# Thank you

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