18 May 2022

How to take advantage of your data to create added value for Pulp Processes

How to capitalize on your Pulp Processing data

Juan Gutiérrez González

About **ENCE**

ENCE has three independent yet complementary areas of business

- **Forestry management:**
  - 65.000 hectares of forest area managed in the Iberian Peninsula.
  - Provides raw material for the other two lines of business.
  - ENCE boasts more than 60 years' experience in wood supply management.

  Pulp producers:
  - We are Europe´s leading eucalyptus pulp producer, with our 2 factories offering a combined maximum installed capacity of 1,2Mn.
  - Our focus is on growing segments of differentiated and special pulp products.
- **Renewable Energy operators:**
  - We are Spain's largest biomass operator, with a current renewable energy installed capacity of 266MW.
  - The renewable energy line provides the stability of regulated business to compensate the cyclical nature of the cellulose market.

About **ENCE**

Sustainable products and Enviromental Excellence

- Pioneers in publishing all our environmental data in our website.
- We have received “Zero residual” certificate in 75% of our plants.
- 1st place in https://www.sustainalytics.com Paper & Forestry segment in 2021.
- Nordic Swan & Ecolabel.

How AVEVA improved our operations

ence ENERGÍA & CELULOSA

Great Place To Work. Certified

Challenge

To achieve our goals in terms of:

- Energy efficiency
- Reducing operation downtime
- Minimizing variability of the processes
- Automating manual tasks

Solution

Deployment of the latest AVEVA PI System, including:

- PI Asset Framework
- Event Frames
- Notifications
- PI Vision

Benefits

In 4 of our main projects:

1) Improved environmental monitoring
2) Reduced energy consumption
3) Reduced variability of the processes
4) Enhanced maintenance tasks

AVEVA

The challenge

- Huge amounts of data requiring registration and subsequent organization.
- After several workshops and intense internal research, we realized AVEVA tools offered big potential that was not yet being taken advantage of.
- A bunch of project ideas came out from those workshops and were prioritized by business impact.
- An internal team was created to develop AVEVA tools, starting with Asset Framework.
- Every single new development is created working closely with the final users. Once the solution is tested, it is scaled.

Using existing instrumentation:

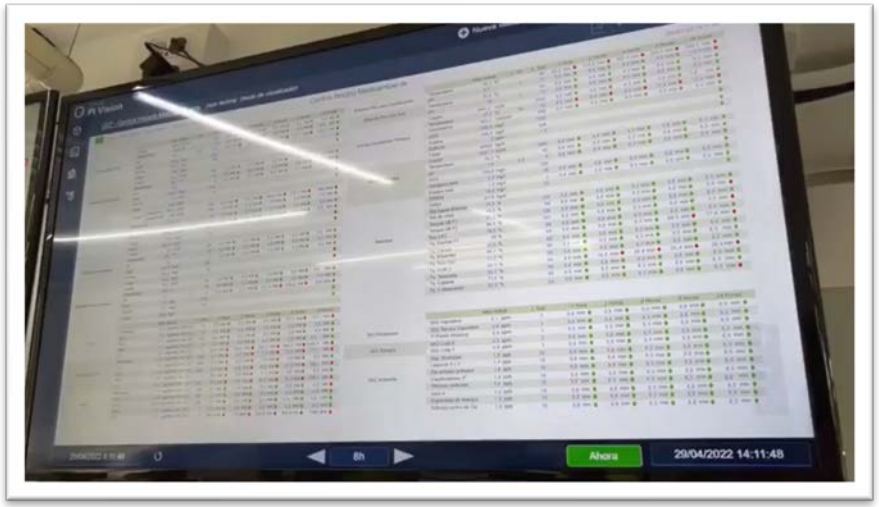
1) Environment monitoring

- Environmental excellence is a priority for ENCE.
- All environmental emissions are tracked and monitored using Event Frames & Notifications, in order to be able to inform all stakeholders.
- Data regarding each single event is stored and acknowledged.
- All subsequent actions taken are registered in the PI Vision application.
- Notifications received by key users contain a pre-analysis of the possible main root cause of the deviation.

Implementation Details

1) Environment monitoring

- Mail Notification
- Check Event
- Analyse event and confirm



Together, all the above actions facilitate future investigations and analysis.
Environment monitoring: Facilitates the analysis in case of any deviation is detected and allows **reducing manual tasks by 60%.**

Supervising the operation range in real time

2) Energy consumption efficiency

- The PI Vision interface offers a follow-up of operation conditions of the main energy consumers.
- The operation range defined in AF and Event Frames is specific for each consumer and detects any conditions that are not being complied with (i.e. control loop mode, SP value…etc.)
- Automatic notifications are generated if a consumer falls out of the desired operation range.
- The notifications received by the key users contain not only detailed information of the deviation but also provide the solution to recover the desired control operation point.

Implementation Details

2) Energy consumption efficiency

Área	Accionamiento	TAGS	Ahora	Ayer	-2 días	-3 días	-4 días	-5 días	-6 días	-7 días	Avg 7 días	Avg 30 días	Condiciones
EyR	BB Nivel CS-6	BB634	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	VDF BB634 en REMOTO
	BB Tanque Homogen.	C19	Paradas	92 %	100 %	100 %	100 %	100 %	100 %	100 %	99 %	94 %	C19 en Remoto
	BBs Alim. Agua Gen. Fábrica	BB291 a BB296	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	2 bombas en marcha y PIC245<2 bar
	BBs Alim. Agua Red a TR Evap	BB119	Paradas	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	BB119 en Auto
	BBs de Alim. Agua CBIO	BB323, BB324, BB325	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	6 %	BB323 ó BB325 en AUTO ó FIC223 <70 y BB323 ó BB325 Paradas
	BBs Red de Segregación	BB281, BB282	35 %	13 %	0 %	0 %	0 %	0 %	7 %	29 %	7 %	15 %	PIC283.MDO en AUTO y PIC283 <=3,61 bar
	Ventiladores TR Eflu. Evap.	TR561, TR571	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	TR561 y TR571 en Remoto con SP>36.8ºC
	Ventiladores TR Gases Dil.	TR461, BB462, TR441	100 %	88 %	0 %	0 %	0 %	0 %	65 %	17 %	24 %	82 %	TR461 y BB462 o TR441 y BB442 parados y TR461 o TR441en Auto con TIC473>43 ºC
	Ventiladores TR22-23-24	HC22, HC23, HC24	100 %	100 %	100 %	100 %	77 %	100 %	100 %	100 %	97 %	99 %	VDF Ventiladores TR22-23-24 en Remoto y CAUSTIFI.TIC664.SET >20,9ºC

Energy consumption efficiency: Thanks to this tool **3500Mwh** have been saved in 2021 in one of our factories


vi. 05/11/2021 16:25
pipontevedra@ence.es
Superación 4 horas
Para Rodriguez Fernandez, Iago

La BB O700 lleva 4 horas en marcha y el lazo en Manual

Through advanced follow-up of the critical instrumentation

3) Reduce variability of the processes

- Instrument and analyzer reliability is crucial for good process control.
- Initially the ENCE Laboratory department was in charge of measuring the variables for controlling the processes.
- New analyzers were installed but operators didn´t really trust them.
- In 2018, online analyzers became the ones to control the pulp processes and the Laboratory department took care of the supervision and control of the well-functioning of online instruments and analyzers.
- Event Frames detects if the value measured by the Laboratory matches the online value and, in case of any deviation, an automatic Maintenance Notice is generated in the CMMS.

Implementation detailes

3) Reduce variability of the processes

Conductividad

Etapa	Parámetro	Hora muestreo	Desviación	Límite +-	Estado	Detalles
Evaporación	Condensado evaporación	03/05/2022 8:20:00	26,33	50		Info
Preevaporación	Condensado preevaporación	03/05/2022 8:20:00	100,4	50		Info
Tto. Aguas	Conduct._1 agua Tq General Condensados	03/05/2022 7:28:00	3,419	3		Info
Tto. Aguas	Conduct._2 agua Tq General Condensados	03/05/2022 7:28:00	-0,06465	3		Info
CRIII	Conductividad agua alimentación CRIII	21/04/2022 7:24:00	0,01905	2		Info
Tto. Aguas	Conductividad agua Desmineralizada a Tanque	03/05/2022 7:37:00	1,297	1,5		Info
CBIO	Conductividad agua purga Caldera de Biomasa	03/05/2022 7:36:00	-44,39	20		Info
CRIII	Conductividad agua purga CRIII	03/05/2022 7:30:00	112,8	20		Info
Tto. Aguas	Conductividad agua salida Cadena 1	03/05/2022 7:35:00	1,09	3		Info
Tto. Aguas	Conductividad agua salida Cadena 2	03/05/2022 7:35:00	0,775	3		Info
Tto. Aguas	Conductividad agua salida Cadena 3	28/04/2022 7:31:00	1,115	3		Info
Tto. Aguas	Conductividad agua salida Cadena 4	03/05/2022 7:35:00	0,713	3		Info
Tto. Aguas	Conductividad agua salida Lecho Mixto	03/05/2022 7:34:00	1,511	1,5		Info
Stripping Preevaporación	Conductividad cond. sucios stripping	02/05/2022 7:00:00	-192,6	50		Info
Tto. Aguas	Conductividad condensado Digestores	03/05/2022 7:31:00	4,14	3		Info
Tto. Aguas	Conductividad condensado Evaporadores	03/05/2022 7:31:00	0,7103	3		Info
CRIII	Conductividad vapor saturado CRIII	03/05/2022 7:30:00	-0,01012	2		Info

AVISOS OLP — Detalles Aviso — Condensado evaporación

Aviso

Area	Medida	Etapa	Instrumento
Energía y Recuperación	Conductividad	Evaporación	Condensado evaporación

Descripción
Para la calibración de los equipos cuando el valor online se desvía de los límites establecidos del valor de muestreo de Laboratorio

Información

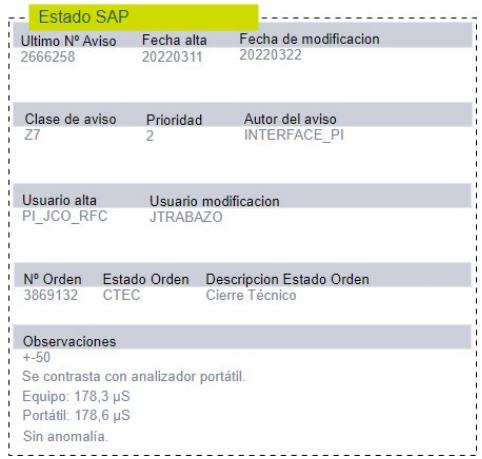
Departamento	Responsable	Petición	Petición|Fecha
Fiabilidad de Mto. de Instrumentación	Santiago Pérez González	Crear avisos a Instrumentación	28/04/2021 8:24:44

Parámetros Medida

Hora muestreo lab	Frecuencia muestreo	Medición laboratorio	Medición online	Desviacion	Limite control +-	Tag online
03/05/2022 8:20:00	2 x Semana (L y J)	206	179,7	26,33	50	CAUSTIFI.CI636.MES

Parámetros SAP

Grupo de Impacto	Código de Impacto	Grupo de Síntoma	Código de Síntoma	Puesto de Trabajo	Prioridad	Ubicación Técnica	Clase Aviso
IMPACTO3	IMP3	INSTRUME	I03	INS	2	I002-6-3-3-7524	Z7



Estado SAP

Ultimo Nº Aviso	Fecha alta	Fecha de modificacion
2666258	20220311	20220322

Clase de aviso	Prioridad	Autor del aviso
Z7	2	INTERFACE_PI

Usuario alta	Usuario modificacion
PI_JCO_RFC	JTRABAZO

Nº Orden	Estado Orden	Descripcion Estado Orden
3869132	CTEC	Cierre Técnico

Observaciones
+-50
Se contrasta con analizador portátil.
Equipo: 178,3 µS
Portátil: 178,6 µS
Sin anomalía.

- Reduce variability of the processes: These changes have significantly improved analyzers reliability and reduced response time & errors in maintenance department.
- **135 analyzers** are working in a reliable way.

Evolution to predictive maintenance

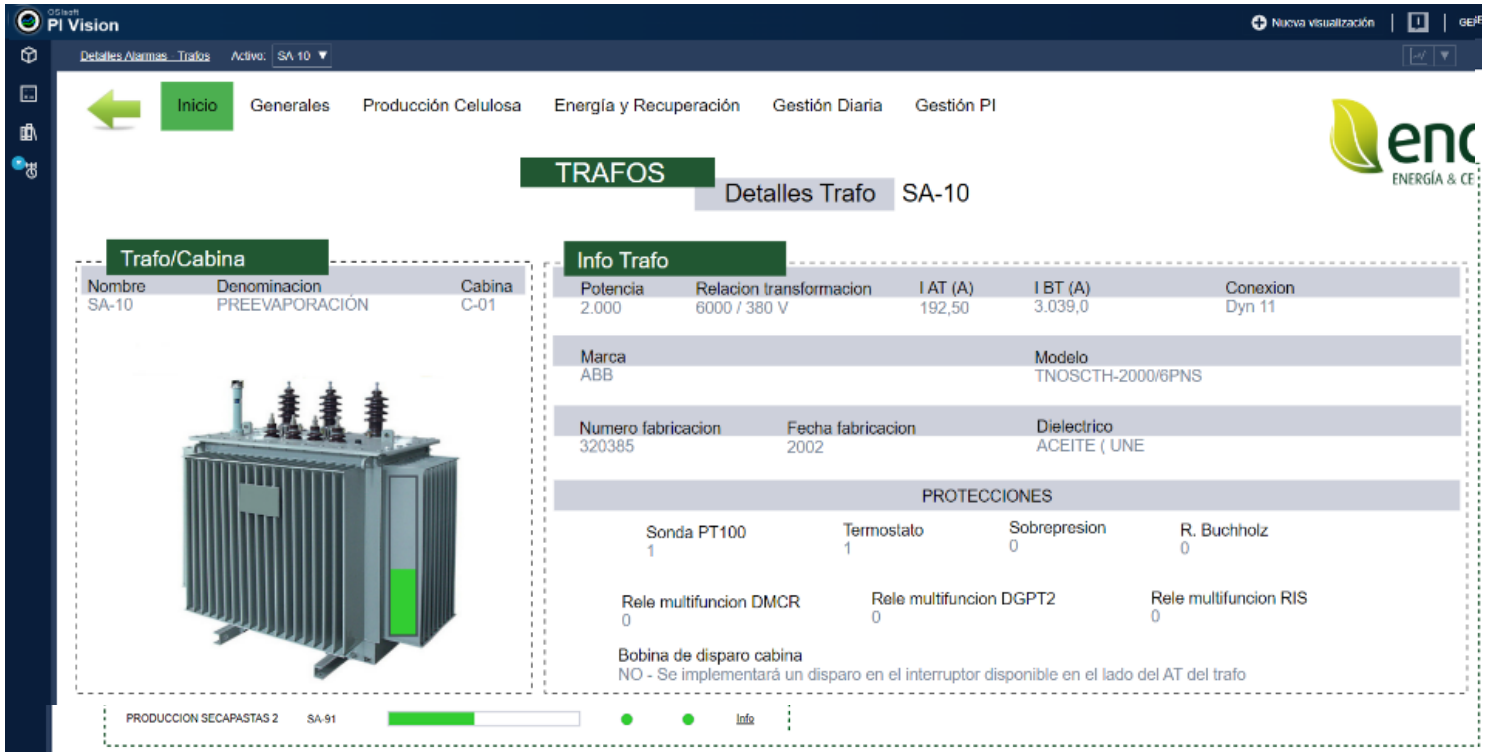
4) Maintenance Evolution

- Using AF templates, maintenance dashboards are used to visualize asset health levels, such us electric transformers, drives...etc.
- Should any early deviation be detected, an automatic notification is generated in CMMS, evolving from corrective maintenance to predictive maintenance.
- Communication with CMMS solution allows PI VISION to centralize interesting information of the assets (i.e. technical specifications or asset data).
- The use of PI Vision as a centralized solution, concentrating all information and outputs of the external partner solutions in the cloud (maintenance, environmental), enables ENCE teams to access all information in one single place.

Implementation details

4) Maintenance Evolution

- Critical assets for maintenance dashboard
- Technical details easy navigation
- Alarm and Maintenance Order Generated



- Maintenance Evolution: Increase assets availability thanks to the early warnings.
  No unscheduled stops in any electrical transformer since the solution was deployed.

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Benefits

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1) **Reduced manual tasks by 60%.**
2) **3500Mwh have been saved**
3) **135 analyzers are working in a reliable way.**
4) **No unscheduled stops in any electrical transformer since the solution was deployed**

AVEVA

Next Steps

- Improve Telegram application.
- Schneider Electric PME (Power Monitoring Expert) implementation.
- Machine Learning Projects.
- Improve reducing variability in processes with SQC calculations.

“Improve small habits to achieve great results”

Quote Credit

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ABOUT AVEVA

AVEVA is a global leader in industrial software, driving digital transformation and sustainability. By connecting the power of information and artificial intelligence with human insight, AVEVA enables teams to use their data to unlock new value. We call this Performance Intelligence. AVEVA's comprehensive portfolio enables more than 20,000 industrial enterprises to engineer smarter, operate better and drive sustainable efficiency. AVEVA supports customers through a trusted ecosystem that includes 5,500 partners and 5,700 certified developers around the world. The company is headquartered in Cambridge, UK, with over 6,500 employees and 90 offices in over 40 countries.

Learn more at www.aveva.com

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