

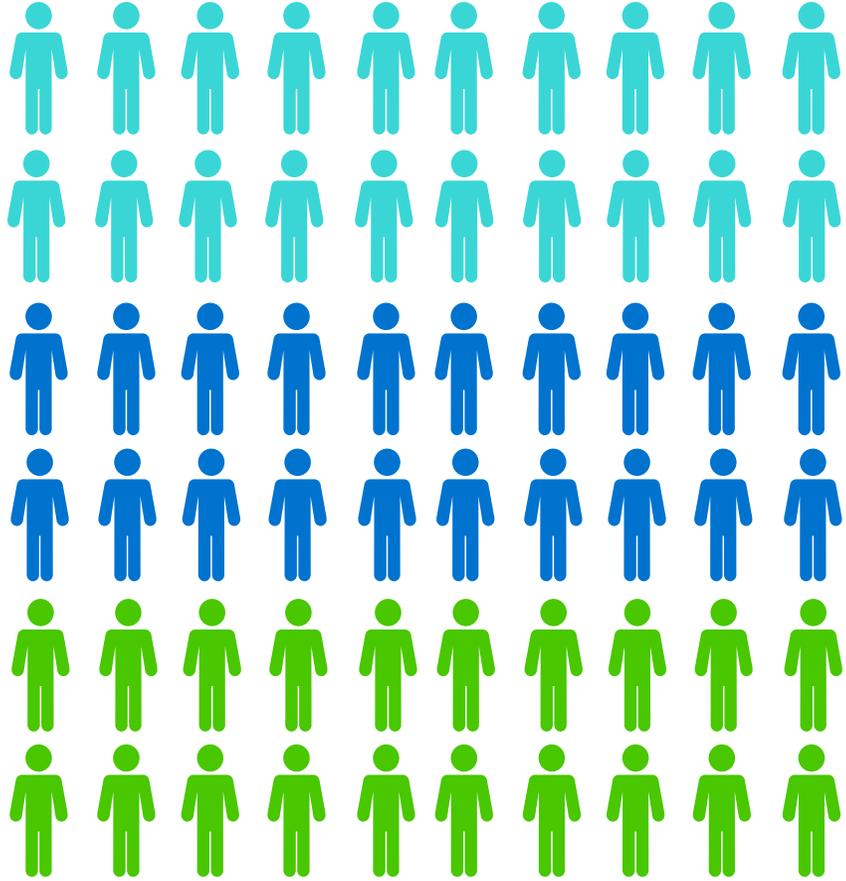
Su gente es la clave para el éxito de Analíticos Avanzados

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Mayo - 2019

OSIsoft: Self-Service Análisis para las Operaciones

Operaciones



Creemos que las personas con datos transforman su mundo

"... teníamos cero visibilidad de datos de operaciones de planta, por lo que las **decisiones se tomaban sin datos que las respalden**".

- Cliente, antes de tener acceso a los datos operacionales

Solución de Compromiso
Esfuerzo de acceder a los datos
VS
Experiencia y Conocimiento



¿Cómo pueden estas preguntas ser respondidas rápidamente?



Gerente de planta

"¿Cuál es el factor de capacidad actual?"



Operador de la planta

"¿Qué ocurre durante el recorte de la turbina?"



Científico de datos

"¿Podemos predecir el fallo de un activo?"

¿Cómo pueden estas preguntas ser respondidas rápidamente?



Gerente de planta

"¿Cuál es el factor de capacidad actual?"

Obstáculos

- Nomenclatura poco familiar
- Distintas versiones de equipos
- Alcances variados



Operador de la planta

"¿Qué ocurre durante el recorte de la turbina?"



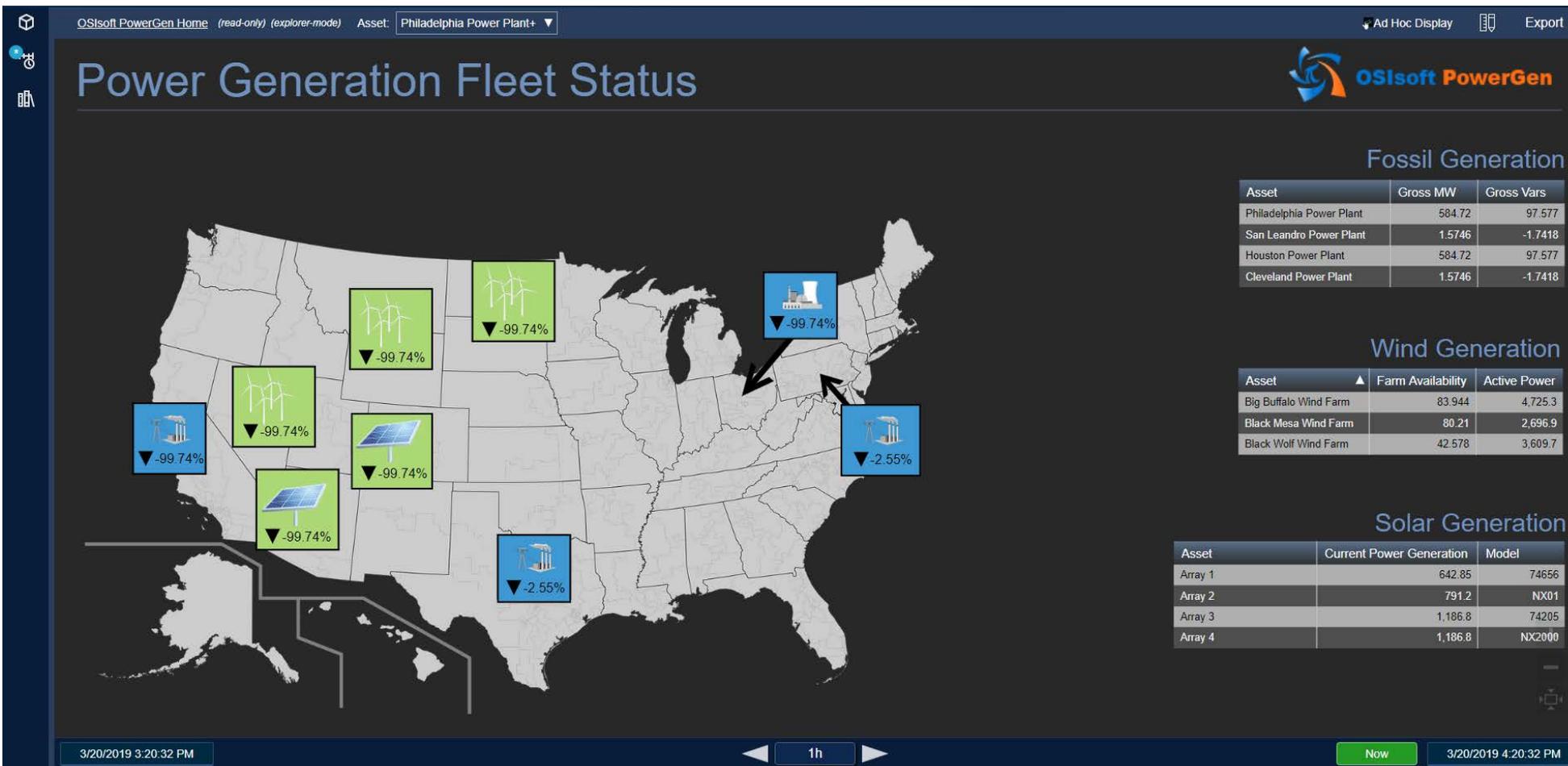
Científico de datos

"¿Podemos predecir el fallo de un activo?"



Gerente de planta

"¿Cuál es el factor de capacidad actual?"



KPI's en vivo para decisiones rápidas
 Conocer la disponibilidad de la red

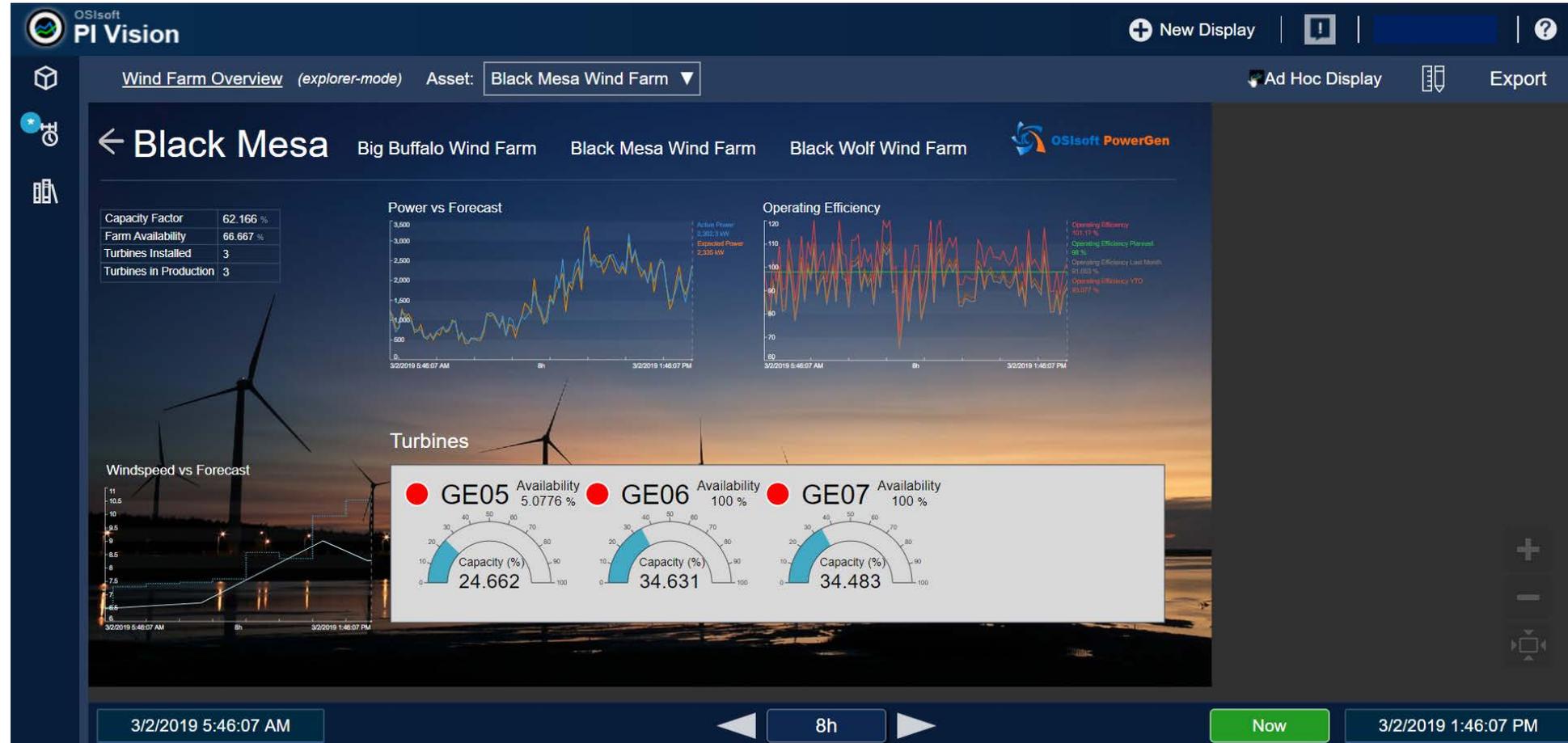
Datos adicionales de soporte
 Objetos basados en activos

Drill Down para granularidad
 Visibilidad a nivel de los equipos



Gerente de planta

"¿Cuál es el factor de capacidad actual?"



Normalización de Mediciones

Comparación de las diversas mediciones de Turbinas

Previsión a largo de la historia

Combinar conocimientos y modelos

Diferentes sitios mismo

Dashboard

Misma vista para todos los parques eólicos

Datos operacionales no están naturalmente estructurados

80-5.Net Volume
GE01_A_DT

DC.SJ.PUE **TI-102** DC.Zero **DY-108** trigger
DC.SJ.C1.Z3.R3.PDU1.PF GE01_A_DT AC09.Power

GE04_OASset1.Problems DC.SJ.SiteRealTimeL
QI-122 FI-151 TLoad.PR FT9001 Anacortes Refinery.Alkylation.Asset **B737_FG117** DC.TimeLoad

02F102.1HRAVG **BGT001** 403511195_Wind Speed AC04.Air Flow **FI-101** bf5e1d1d-39c9- GE04_DT **QI-121** GE03_V_WIN

PI-111 facility_output 0_ENG_MODE_STS FI-151 4-36.NetVolume **AC04.Air Flow** 03LBB02CT001-2 4b5b-b3d3-c2ce05fa3a26 GE04_DT **QI-121** GE03_V_WIN

AQUA2-TI-201.PV 02T100 02T100 03LBB02CT001-2 4b5b-b3d3-c2ce05fa3a26 **DC.Rk07R**

AlarmTest.Input.Float32.1 **364511575-AC Power** DC.NY.Actual.PWR.day.Tot 0 CLR_FINAL_OUT_B TDC.Srv06R GE04_Energy
339511775_Clear Sky **TI-121** FT9001

FI-101 bf5e1d1d-39c9-4b5b-b3d3-c2ce05f GE01_DT **409510395_Wind Speed** **QI-109**
GE01_DT **Cooling Fan-711.Feed Rate**

BGE003 FI-111 02T100 GE01_DT **Boiler-209.Fuel Gas**
AF_FLOW3 02:T103 AT401 **Flow** DC.Srv01R

ACEDemo.Unit1.Output 0_ENG_MODE_STS **FI-151** DC.Srv01R
TI-178 B352_W778 0_CMP_SVLV_PCT DC.Z1R **125.Fuel Gas** **94:GRDIDX.Tr**
02F104 CD:F161 **80-13.Net** 0_CMP_HDR **Volume** **FI-151** **D-110.Tank**
94:BW.R TI-101 1-13.Net **DY-131** DC.Srv01R **Pressure.P**
F723_E889 **Volume** **DY-131** DC.SJ.C1.Z1.R1.Rk06.S2. **Boiler Feed**
369512185-Temp B045_FG978 **Compressor-439.Feed** **Rate** **QI-111** FinalProductBin.On **Pump #1**
DC.CH.DCE **FIC-172:210** GE01_DT **FI-101** bf5e1d1d-39c9-4b5b-b3d3-c2ce05fa3a26 **1-16.Net Volume** **Volume**
FI-121 AF_FLOW3 0_ENG_MODE_STS 0 CLR_FINAL_OUT_B **CB1992_MS** 03LBA32CT0
GE03_Q **DY-131:166** GE01_TD **Boiler-334.Feed Rate** **FI-101** Volume **01-2** DC.SJ.ITLoad.P
WR

02F102.1HR **BGE003 FI-111 02T100** FT9001 **TI-145** fasttag FR2001
AVG **AF_FLOW3 02:T103** 403511195_Wind Speed **TI-178** DC.Zone1.Number **GE04_OS**
BGT001 ACEDemo.Unit1.Output **TI-178 B352_W778** FT9001 **FR5001**
PI-111 **TI-178 B352_W778** 0_CMP_SVLV_PCT **02F104 CD:F161** FT9001 **FR5001**
AT401 **02F104 CD:F161** **DC.C2Z1.Pwr.Ripple** AF_NOISE
FIC-144 GE04_Status **FI-101** Volume **FT9001** **TI-145** fasttag FR2001
02F100 fasttag **02:F101.C** 403511195_Wind Speed **QI-109** GE01_DT **Cooling Fan** DM-05:BW.R
AQUA2-SI005.PV GE02_Energy **QI-109** GE01_DT **Cooling Fan** DM-05:BW.R
0_ENG_MODE_STS **FI-151 02T103.Q** TI-178 **DC.SJ.C1.Z1.R1.R**
DC.Z1R 0_CMP_HDR_SUC_PR **Asset1_output** **FI-101** **DC.SJ.C1.Z1.R1.R**
k06.S2.003.PWR **QI-111** FinalProductBin.On
FI-111 Active Meters **GE01_A_DT** **as0** **02:F101.C** **94:GRDIDX.Pr**
AF_NOISE **PI-115** **DY-101** **02** **odID** **Boiler-**
DM-05:BW.R **FR2001** **TIC-121** **209.Fuel Gas** **Flow**

Crude Desalter

Operating Pressure: 110 psi
Charge Rate: 14 gph
Mix Valve Pressure: 8 psi
Water Rate: 8%

Weather Conditions

Relative Humidity: 34%
Current Temp: 85 F
High: 92 F
Low: 57 F
Wind: 8 mph/N

Crude Furnace

Draft Pressure: -0.5 WC
Stack Temp: 316 F
Oxygen: 2.5%
Outlet Temp: 840 F
Cold Oil Velocity: 6 ft/sec

➔ **Cómo?**

Definir un lenguaje común y un modelo de activos

The screenshot displays the OSIsoft software interface. On the left, a tree view under 'Elements' shows a hierarchy: 'Generation' -> 'Wind Power Generation Fleet' -> 'Black Mesa Wind Farm' -> 'GE05'. Below the tree is a navigation pane with icons for 'Elements', 'Event Frames', 'Library', 'Unit of Measure', 'Contacts', and 'Management'. The main area on the right is titled 'GE05' and has tabs for 'General', 'Child Elements', 'Attributes', 'Ports', 'Analyses', 'Notification Rules', and 'Version'. The 'Attributes' tab is active, showing a table with columns 'Name' and 'Value'. The table lists various categories such as 'Category: <None>', 'Category: Alarms', 'Category: Availability', 'Category: Electrical Measurements', 'Category: Events', 'Category: Gearbox', 'Category: Generator', 'Category: Identification', 'Category: Location', 'Category: Mechanical Measurements', 'Category: Met', 'Category: Nacelle', 'Category: Power Active', 'Category: Power Expected', 'Category: Status', 'Category: Thermal', and 'Category: Tower'. At the bottom left of the interface, it says '111 Attributes'.

GE05

General Child Elements Attributes Ports Analyses Notification Rules Version

Filter

Name	Value
Category: Identification	
Gearbox Serial Number	4800000-0000-0
Gearbox Type	WindEnergy
Manufacturer	GE
Model	1.5 csCWE
Power Rated	1000 kW
Serial Number	M000000
Turbine Name	WTG05
Category: Location	
Latitude	36.17 °
Longitude	-106.06 °
Wind Farm	Black Mesa Wind Farm
Category: Mechanical Measurements	
Category: Met	
Category: Nacelle	
Category: Power Active	
Category: Power Expected	
Category: Status	
Capacity	25.664 %
Operating State	Load Shutdown

Group by: Category Template

Name: Capacity

Description:

Properties: <None>

Categories: Generator;Status

Default UOM: percent

Value Type: Double

Value: 25.664 %

Data Reference: PI Point

Display Digits: -5

Settings...

```
\\DFPIServerPrd.osisoft.ext\GE05_Capacity;UOM="%"
```

Identificar atributos e información auxiliar para un modelo de activos

Library

- Station
- Steam Turbine
- Steam Turbine Template
- Substation
- test_trait
- TestFormulaTemplate
- Tracker
- TrackerMaster_ERCAM
- Transformer
- TRTemplate
- Turbine
- Turbines
- Unit
- Unit Template
- USGS_RiverDataTemplate
- Wind Farm Fleet
- Wind FarmTemplate
- Wind Turbine
- Windtopia Wind Farm Fleet
- Windtopia Wind Farm Template
- Windtopia Wind Turbine
- Event Frame Templates
- Model Templates
- Transfer Templates
- Enumeration Sets
- Reference Types
- Tables

Elements

Event Frames

Library

Unit of Measure

Contacts

Wind Turbine

General Attribute Templates Ports Analysis Templates Notification Rule Templates

Filter

Name	Description	Default Value
Category: Identification		
Gearbox Serial Number		4800000-0000-0
Gearbox Type		WindEnergy
Manufacturer		GE
Model		1.5 csCWE
Power Rated		1500 kW
Serial Number		M000000
Turbine Name		WTG
Category: Location		
Latitude		0 °
Longitude		0 °
Wind Farm		0
Category: Mechanical Measurements		
Category: Met		
Category: Nacelle		
Category: Power Active		
Category: Power Expected		
Category: Status		
Capacity		0 %
Operating State		

Group by: Category Template

Name: Capacity

Description:

Properties: <None>

Categories: Generator;Status

Default UOM: percent

Value Type: Double

Default Value: 0 %

Data Reference: PI Point

Display Digits: -5

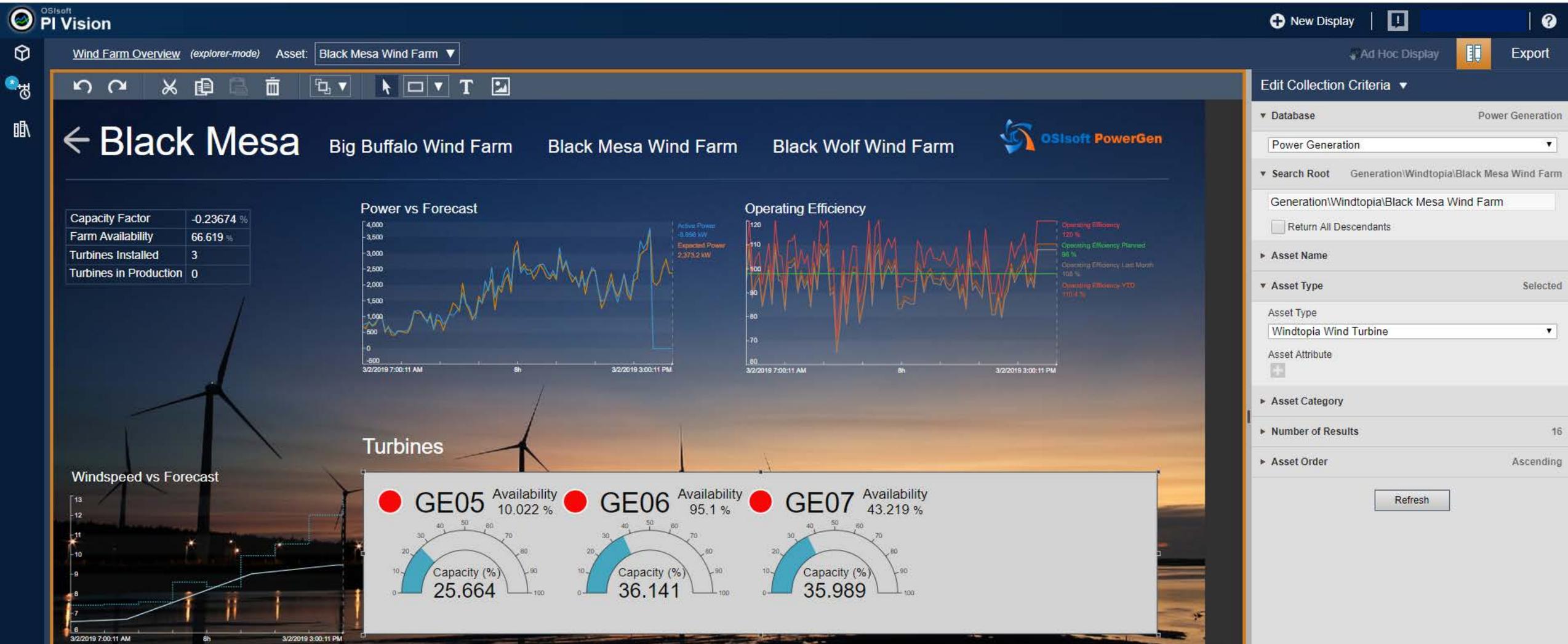
Settings...

```
\\DFPIServerPrd.osisoft.ext\%Element%\_Capacity;UOM="%"
```

Usar templates para la consistencia a través de diversos activos

Configurar cálculos de sumariazación para asegurar consistencia en la jerarquía

The screenshot shows the PI System Explorer interface. On the left, a tree view displays the hierarchy of elements, including 'Black Mesa Wind Farm' and its sub-elements 'GE01' through 'GE10'. The main window is titled 'Black Mesa Wind Farm' and shows the configuration for an 'Active Power Rollup' analysis. The 'Analysis Type' is set to 'Rollup'. The 'Rollup attributes from' section is configured to use 'Child elements of Black Mesa Wind Farm'. The 'Attribute Name' is 'Active Power' and the 'Attribute Level' is 'Root Level'. The 'Function' section shows 'Sum' selected, with the output 'Farm Total Power'. The 'Sample Child Element' is set to 'GE01'. The 'Rollup attributes from' section also shows a list of attributes to be included in the rollup, such as 'Active Power', 'Apparent Power', and various temperature and error metrics. The 'Scheduling' is set to 'Event-Triggered' and the 'Trigger on' is 'Any Input'. The status bar at the bottom right indicates 'Connected to the PI Analysis Service.'



Tableros basados en contexto y en estructura para la consistencia y la reutilización

¿Cómo pueden estas preguntas ser respondidas rápidamente?



Gerente de planta

"¿Cuál es el factor de capacidad actual?"



Operador de la planta

"¿Qué ocurre durante el recorte de la turbina?"



Científico de datos

"¿Podemos predecir el fallo de un activo?"

¿Cómo pueden estas preguntas ser respondidas rápidamente?



Gerente de planta

"¿Cuál es el factor de capacidad actual?"

Obstáculos

- Eventos ocultos en el flujo de datos
- Identificación de mediciones relevantes
- Requerimientos de "scripting"



Operador de la planta

"¿Qué ocurre durante el recorte de la turbina?"



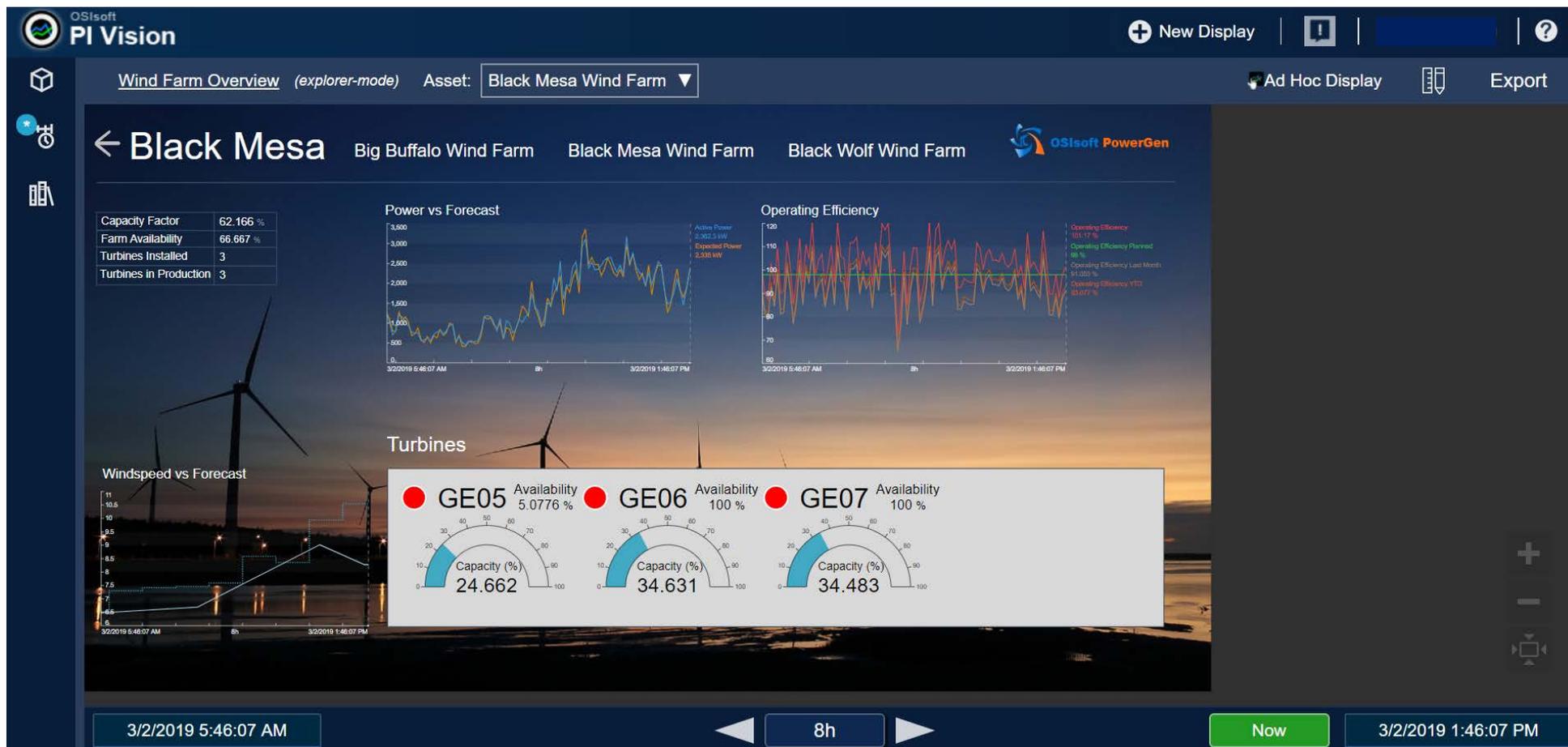
Científico de datos

"¿Podemos predecir el fallo de un activo?"



Operador de la planta

“¿Qué ocurre durante el recorte de la turbina?”



Comenzar el análisis a nivel del sitio
Apalancamiento visual del contexto



Operador de la planta

“¿Qué ocurre durante el recorte de la turbina?”

Comparación de eventos por el operador

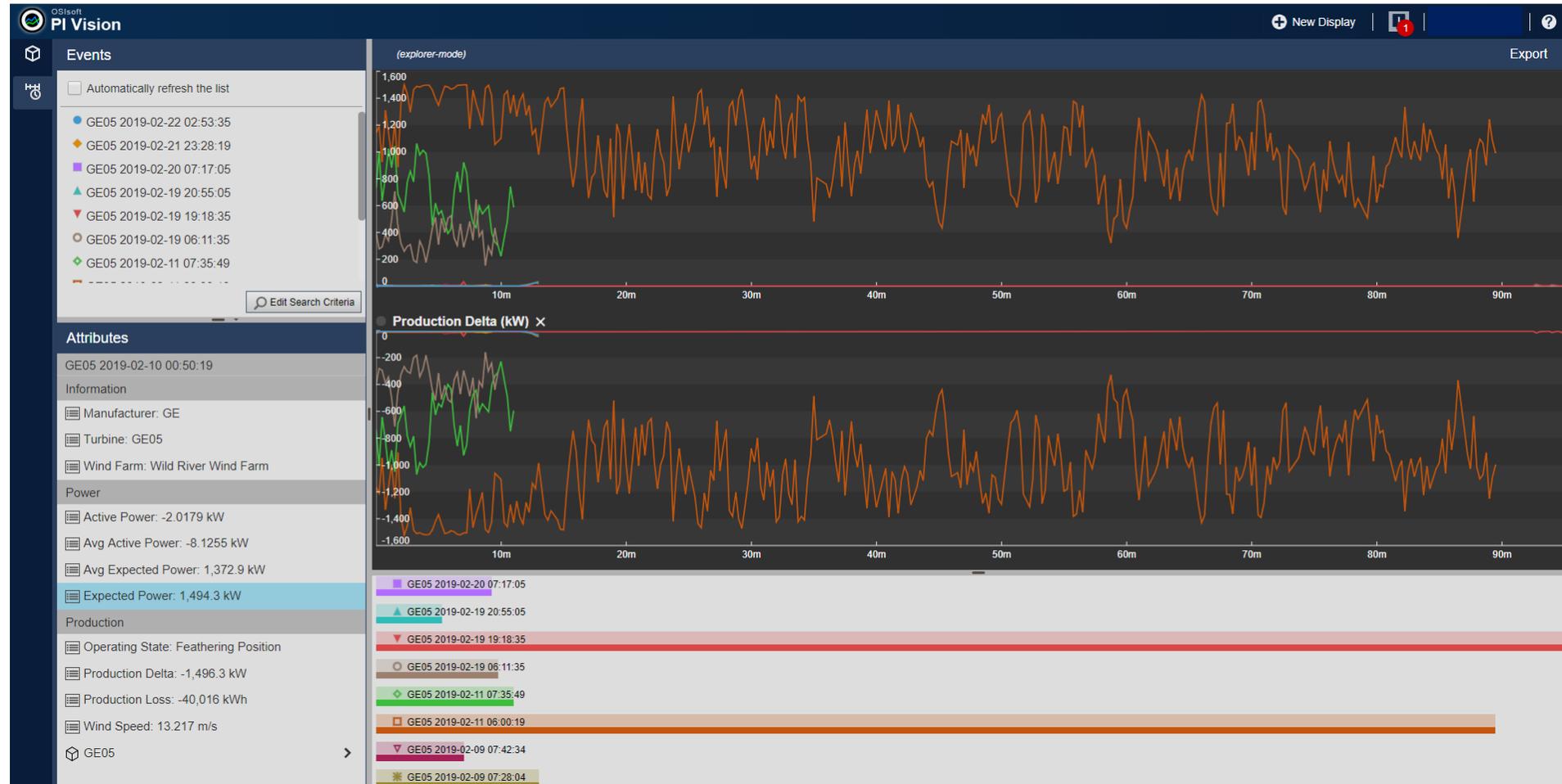
No necesita de un equipo central para comparar los datos

Comparación rápida de eventos

Búsqueda de eventos de mayor duración

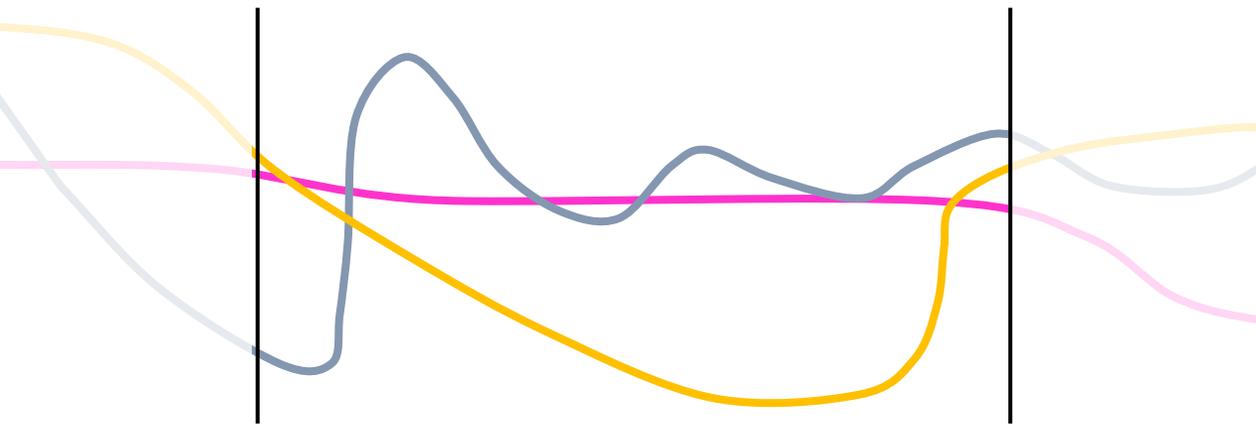
Insights sin código

Sólo necesita arrastrar y soltar

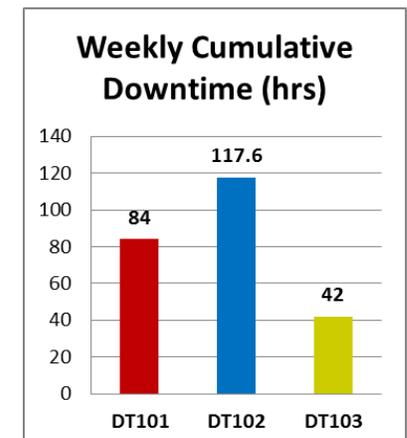
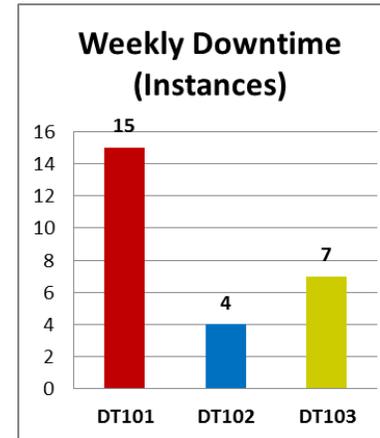


Los Flujos de Datos No Contienen Eventos Discretos por Defecto

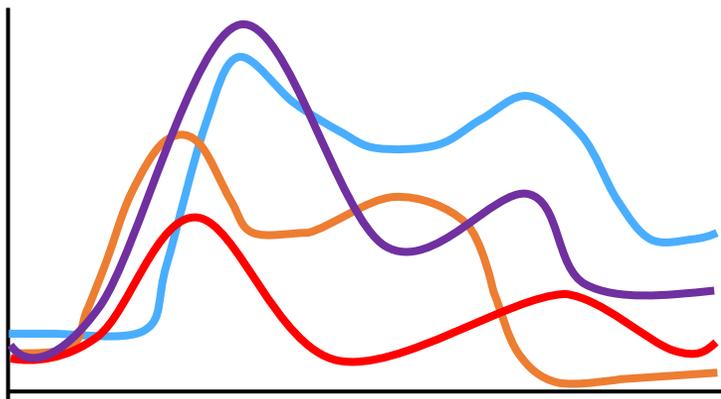
Simplificar Análisis de Datos



Comparar Activos

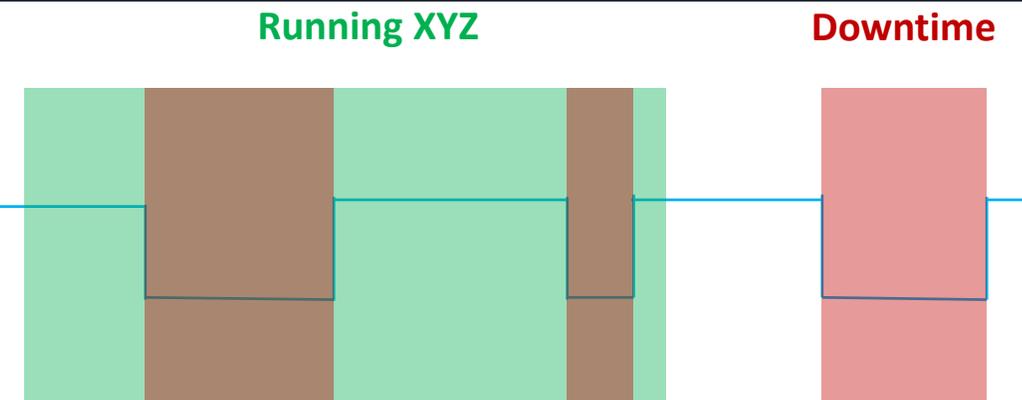


Comparar Eventos



Name	Max
EF1	122.47
EF2	112.73
EF3	98.61
EF4	125.24

Descubrir Relaciones entre Eventos



Elements

- Generation
 - Equipment List
 - Fossil Generating Station
 - Matador 1 CCGT
 - OSIsoft Power
 - PowerCo
 - Solar Power Generation Fleet
 - Wind Power Generation Fleet
 - Big Buffalo Wind Farm
 - Black Mesa Wind Farm
 - GE01
 - GE02
 - GE03
 - GE04
 - GE05
 - GE06
 - GE07
 - GE08
 - GE09
 - GE10
 - Black Wolf Wind Farm
 - Deep Valley Wind Farm
 - Eldorado Wind Farm
 - Grand Ridge Wind Farm
 - White Bear Wind Farm
 - Wild River Wind Farm

GE05

General Child Elements Attributes Ports Analyses Notification Rules Version

Name: Turbine Curtailment

Description:

Categories:

Analysis Type: Expression Rollup Event Frame Generation SQC

[Create a new notification rule for Turbine Curtailment](#)

Name	Backfilling
Apparent Power	✓
Gearbox Temperature Average	!
High Temperature Event	⊞
Power Factor	✓
Production Delta	✓
Turbine Curtailment	✓

Generation Mode: Explicit Trigger Event Frame Template: Wind Curtailmer

Name	Expression	True for	Severity
Start triggers			
StartTrigger	'Operating State' = "Feathering Position"	5 minutes	None

Advanced Event Frame Settings...

Scheduling: Event-Triggered Periodic

Trigger on Any Input

Functions

Insert functions into the expression

All

- Abs
- Acos
- And
- Abs(number x)
Return the absolute value of an integer or real number.
Example: Abs(-2.2) [Returns 2.2]
- Attributes

● Connected to the PI Analysis Service.

GE05 Modified:2/3/2019 5:57:56 PM Owner:system Version: 1/1/1970 12:00:00 AM, Revision 16

Decidir un disparador lógico y qué medir durante el evento

Marcar eventos
consistentemente
sobre el mismo tipo
de activo y guardar
las mismas
mediciones

The screenshot displays the OSIsoft software interface. On the left, the 'Library' pane shows a tree view of various event types, including 'Wind Curtailment'. Below the library, a navigation pane lists 'Elements', 'Event Frames', 'Library', 'Unit of Measure', and 'Contacts'. The main area shows the 'Wind Curtailment' attribute templates, with tabs for 'General' and 'Attribute Templates'. A table lists attributes categorized into Information, Power, and Production.

Name	Description	Default Value
Category: Information		
Manufacturer		0
Turbine		0
Wind Farm		0
Category: Power		
Active Power		0 kW
Avg Active Power		0 kW
Avg Expected Power		0 kW
Expected Power		0 kW
Category: Production		
Operating State		
Production Delta		0 kW
Production Loss		0 kWh
Wind Speed		0 m/s

General Child Elements Attributes Ports Analyses Notification Rules Version

Name: IP Turbine

Description:

Categories:

Analysis Type: Expression Rollup Event Frame Generation SQC

Name	Expression	Output Attribute
HotRHtempAvg	<code>Avg('HotRHTemperatureN', 'HotRHTemperatureS')</code>	HotRHTemperatureAvg
HotRHtempAvgDegC	<code>Convert('HotRHTemperatureAvg', "°C")</code>	Map
HotRHPressAvg	<code>Avg('HotRHPressureN', 'HotRHPressureS')+'Atmosphericpressure'</code>	HotRHPressureAvg
HotRHPressKPa	<code>Convert('HotRHPressureAvg', "kPa")</code>	Map
HRHEnthalpy	<code>Steam_HPT(HotRHPressKPa, HotRHtempAvgDegC)</code>	HotRHEnthalpy
HRHEntropy	<code>Steam_SPT(HotRHPressKPa, HotRHtempAvgDegC)</code>	Map
IPOtempAvg	<code>Avg('IPTurbineOutletTempN', 'IPTurbineOutletTempS')</code>	IPTurbineOutletTempAvg
IPOtempDegC	<code>Convert('IPTurbineOutletTempAvg', "°C")</code>	Map
IPOPresAvg	<code>Avg('IPTurbineOutletPressN', 'IPTurbineOutletPressS')+'Atmosphericpressure'</code>	IPTurbineOutletPressAvg
IPOPressKPa	<code>Convert('IPTurbineOutletPressAvg', "kPa")</code>	Map
IPOEnthalpy	<code>Steam_HPT(IPOPressKPa, IPOtempDegC)</code>	Map
IPTisentrpEnthalpy	<code>Steam_HPS(IPOPressKPa, HRHEntropy)</code>	Map
IPTeff	<code>((HRHEnthalpy-IPOEnthalpy)*100)/(HRHEnthalpy-IPTisentrpEnthalpy)</code>	IPTurbineEff

Scheduling: Event-Triggered Periodic

Trigger on: Any Input

Advanced...

Connected to the PI Analysis Service.

Functions

Insert functions into the expression [Reload](#)

All

- IsSet
- LastValue
- LCase
- Left
- Len
- LinRegr
- Log
- Log10
- Logbase
- LTrim
- MapData
- Max
- Median
- Mid
- Min
- Minute
- Mod
- Month

Abs(number x)
Return the absolute value of an integer or real number.
Example: Abs(-2.2) [Returns 2.2]

Attributes

○ Configure calculations simple & retrieve proportional

The screenshot displays the OSIsoft PI Vision interface for monitoring and analyzing events. On the left, the 'Events' list shows several entries for GE05 turbines with timestamps. Below it, the 'Attributes' section provides detailed information for a selected event, including manufacturer (GE), turbine ID (GE05), wind farm (Wild River Wind Farm), and power-related metrics like active power, average active power, and expected power. The central area features two line charts showing 'Production Delta (kW)' over time, with a zoomed-in view of a specific event. The right sidebar, titled 'Edit Search Criteria', allows users to filter events based on database, time range, severity, name, type, and asset information. The search criteria are currently set to 'Power Generation', 'Last 30 Days', 'Selected', 'Wind Curtailment', 'Any', and 'Wind Turbine'.

Comparación de eventos ad hoc hereda la estructura de eventos y de activos y así permite la comparación fácil de eventos

¿Cómo pueden estas preguntas ser respondidas rápidamente?



Gerente de planta

"¿Cuál es el factor de capacidad actual?"



Operador de la planta

"¿Qué ocurre durante el recorte de la turbina?"



Científico de datos

"¿Podemos predecir el fallo de un activo?"

¿Cómo pueden estas preguntas ser respondidas rápidamente?



Gerente de planta

"¿Cuál es el factor de capacidad actual?"

Obstáculos

- Ninguna relación física entre los flujos de datos de la turbina?
- Diversos modelos de equipos y mediciones
- Sin nomenclatura estándar



Operador de la planta

"¿Qué ocurre durante el momento de la turbina?"



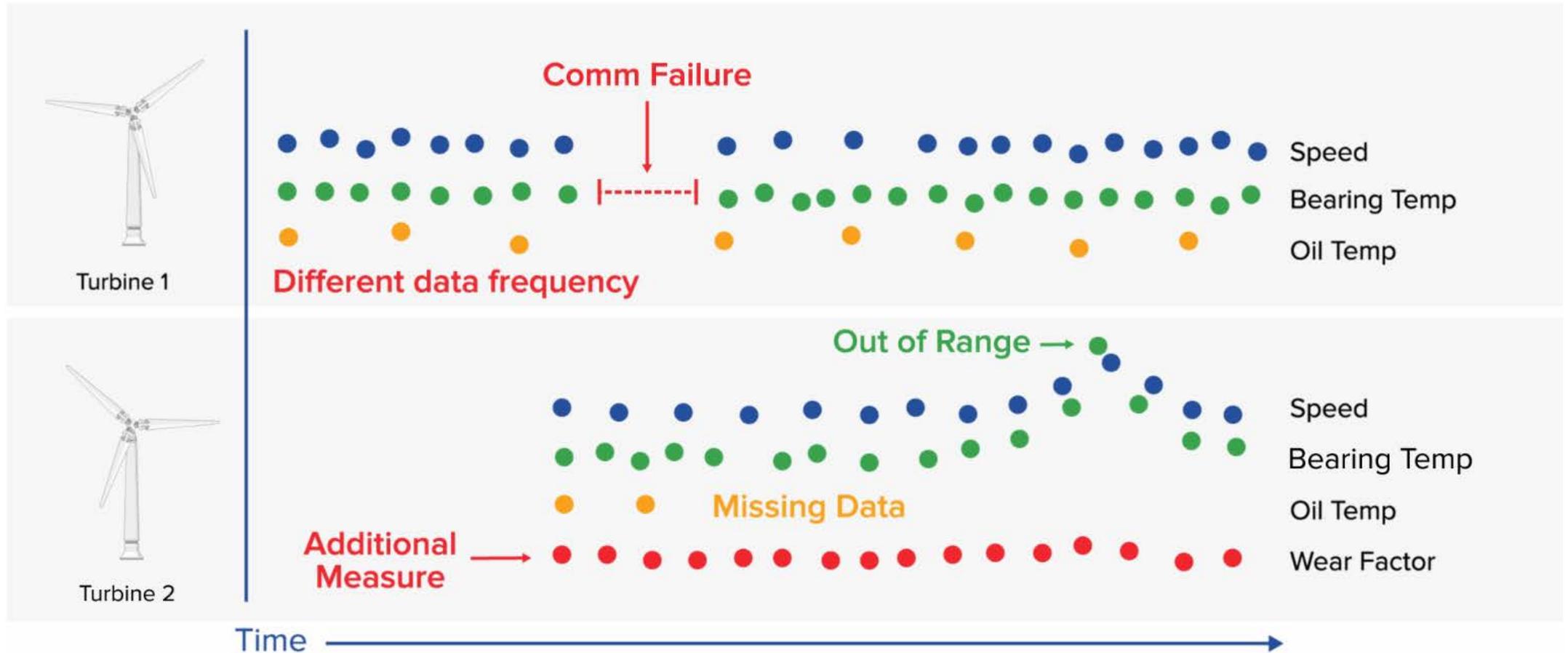
Científico de datos

"¿Podemos predecir el fallo de un activo?"

Algoritmos y herramientas de BI esperan datos limpios y alineados

Wind Turbine	TimeStamp	Day of the Week	Active Power	Apparent Power	Bearing A Temperature	Capacity	Operating Efficiency	Rotor Speed
GE01	3/2/2019 2:31:12.759 PM	Saturday	-0.001	4.233	35.764	36.026	91.943	0.404
GE01	3/2/2019 2:32:12.759 PM	Saturday	-0.001	4.237	35.757	36.026	91.734	0.465
GE01	3/2/2019 2:33:12.759 PM	Saturday	-0.001	4.242	35.751	36.026	91.555	0.162
GE01	3/2/2019 2:34:12.759 PM	Saturday	-0.001	4.246	35.745	36.026	91.436	0.157
GE01	3/2/2019 2:35:12.759 PM	Saturday	-0.001	4.25	35.738	36.026	91.274	0.287
GE01	3/2/2019 2:36:12.759 PM	Saturday	-0.001	4.254	35.732	36.026	91.124	0.377
GE01	3/2/2019 2:37:12.759 PM	Saturday	-0.001	4.258	35.726	36.026	90.958	0.437
GE01	3/2/2019 2:38:12.759 PM	Saturday	-0.001	4.263	35.719	36.026	90.824	0.361
GE01	3/2/2019 2:39:12.759 PM	Saturday	-0.001	4.267	35.713	36.026	90.663	0.284
GE01	3/2/2019 2:40:12.759 PM	Saturday	-0.001	4.271	35.706	36.026	90.42	0.207
GE01	3/2/2019 2:41:12.759 PM	Saturday	-0.001	4.275	35.7	36.026	90.152	0.333
GE01	3/2/2019 2:42:12.759 PM	Saturday	-0.001	4.279	35.694	36.026	89.885	0.475
GE01	3/2/2019 2:43:12.759 PM	Saturday	-0.001	4.284	35.687	36.026	89.682	0.185
GE01	3/2/2019 2:44:12.759 PM	Saturday	-0.001	4.288	35.681	36.026	89.467	0.168
GE01	3/2/2019 2:45:12.759 PM	Saturday	-0.001	4.292	35.675	36.026	89.284	0.279
GE01	3/2/2019 2:46:12.759 PM	Saturday	-0.001	4.296	35.668	36.026	89.06	0.389
GE01	3/2/2019 2:47:12.759 PM	Saturday	-0.001	4.3	35.662	36.026	88.882	0.5
GE01	3/2/2019 2:48:12.759 PM	Saturday	-0.001	4.305	35.656	36.026	88.766	0.174
GE01	3/2/2019 2:49:12.759 PM	Saturday	-0.001	4.309	35.649	36.026	88.539	0.763
GE01	3/2/2019 2:50:12.759 PM	Saturday	-0.001	4.313	35.643	36.026	88.312	0.137
GE01	3/2/2019 2:51:12.759 PM	Saturday	-0.001	4.317	35.637	36.026	88.052	0.553
GE01	3/2/2019 2:52:12.759 PM	Saturday	-0.001	4.322	35.63	36.026	87.871	0.507
GE01	3/2/2019 2:53:12.759 PM	Saturday	-0.001	4.326	35.624	36.026	87.731	0.461
GE01	3/2/2019 2:54:12.759 PM	Saturday	-0.001	4.33	35.617	36.026	87.597	0.415
GE01	3/2/2019 2:55:12.759 PM	Saturday	-0.001	4.334	35.611	36.026	87.391	0.369
GE01	3/2/2019 2:56:12.759 PM	Saturday	-0.001	4.338	35.605	36.026	87.195	0.417
GE01	3/2/2019 2:57:12.759 PM	Saturday	-0.001	4.343	35.598	36.026	87.045	0.463
GE01	3/2/2019 2:58:12.759 PM	Saturday	-0.001	4.347	35.592	36.026	86.928	0.287
GE01	3/2/2019 2:59:12.759 PM	Saturday	-0.001	4.351	35.586	36.026	86.769	0.298
GE01	3/2/2019 3:00:12.759 PM	Saturday	-0.001	4.355	35.579	36.026	86.597	0.324
GE01	3/2/2019 3:01:12.759 PM	Saturday	-0.001	4.359	35.573	36.026	86.459	0.375
GE01	3/2/2019 3:02:12.759 PM	Saturday	-0.001	4.364	35.567	36.026	86.310	0.462

Datos en series de tiempo no están alineados naturalmente



The screenshot displays the OSIsoft interface for 'LK_WindFarm'. It features three main panels:

- Source Assets:** Shows 'Server' set to 'DFPIAFSERVERPRD' and 'Database' set to 'Power Generation'. A tree view under 'Assets' shows 'Black Mesa Wind Farm' expanded, with 'GE05' selected.
- Search Shape:** Lists attributes for 'Wind Turbine' including 'Active Power', 'Apparent Power', 'Bearing A Temperature', 'Capacity', 'Operating Efficiency', and 'Rotor Speed'.
- Matches:** Displays 'Found 75 Matches' with a list of asset identifiers such as 'GE01', 'GE02', and 'GE03'.

A large, faint 3D cube icon is centered in the background of the interface.

Arrastrar y soltar
atributos para
formar objetos de
datos **sin** la
necesidad de
escribir **scripts**

Incluir más funciones potenciales y filtrar los datos irreales

LK_WindFarm

Select Data > **Modify View** > Publish

+ Add Column (9 columns) |
 Edit Row Filters (0 Row Filters) |
 Edit Value Mode (Interpolated Values Every 1 minute)

Start Time: *-1h | End Time: *

Apply

Wind Turbine	TimeStamp	Day of the Week	Active Power	Apparent Power	Bearing A Temperature	Capacity	Operating Efficiency	Rotor Speed
GE01	3/2/2019 2:31:12.759 PM	Saturday	-0.001	4.233	35.764	36.026	91.943	0.404
GE01	3/2/2019 2:32:12.759 PM	Saturday	-0.001	4.237	35.757	36.026	91.734	0.465
GE01	3/2/2019 2:33:12.759 PM	Saturday	-0.001	4.242	35.751	36.026	91.555	0.162
GE01	3/2/2019 2:34:12.759 PM	Saturday	-0.001	4.246	35.745	36.026	91.436	0.157
GE01	3/2/2019 2:35:12.759 PM	Saturday	-0.001	4.25	35.738	36.026	91.274	0.287
GE01	3/2/2019 2:36:12.759 PM	Saturday	-0.001	4.254	35.732	36.026	91.124	0.377
GE01	3/2/2019 2:37:12.759 PM	Saturday	-0.001	4.258	35.726	36.026	90.958	0.437
GE01	3/2/2019 2:38:12.759 PM	Saturday	-0.001	4.263	35.719	36.026	90.824	0.361
GE01	3/2/2019 2:39:12.759 PM	Saturday	-0.001	4.267	35.713	36.026	90.663	0.284
GE01	3/2/2019 2:40:12.759 PM	Saturday	-0.001	4.271	35.706	36.026	90.42	0.207
GE01	3/2/2019 2:41:12.759 PM	Saturday	-0.001	4.275	35.7	36.026	90.152	0.333
GE01	3/2/2019 2:42:12.759 PM	Saturday	-0.001	4.279	35.694	36.026	89.885	0.475
GE01	3/2/2019 2:43:12.759 PM	Saturday	-0.001	4.284	35.687	36.026	89.682	0.185
GE01	3/2/2019 2:44:12.759 PM	Saturday	-0.001	4.288	35.681	36.026	89.467	0.168
GE01	3/2/2019 2:45:12.759 PM	Saturday	-0.001	4.292	35.675	36.026	89.284	0.279
GE01	3/2/2019 2:46:12.759 PM	Saturday	-0.001	4.296	35.668	36.026	89.06	0.389
GE01	3/2/2019 2:47:12.759 PM	Saturday	-0.001	4.3	35.662	36.026	88.882	0.5
GE01	3/2/2019 2:48:12.759 PM	Saturday	-0.001	4.305	35.656	36.026	88.766	0.174
GE01	3/2/2019 2:49:12.759 PM	Saturday	-0.001	4.309	35.649	36.026	88.539	0.763
GE01	3/2/2019 2:50:12.759 PM	Saturday	-0.001	4.313	35.643	36.026	88.312	0.137
GE01	3/2/2019 2:51:12.759 PM	Saturday	-0.001	4.317	35.637	36.026	88.052	0.553
GE01	3/2/2019 2:52:12.759 PM	Saturday	-0.001	4.322	35.63	36.026	87.871	0.507
GE01	3/2/2019 2:53:12.759 PM	Saturday	-0.001	4.326	35.624	36.026	87.731	0.461
GE01	3/2/2019 2:54:12.759 PM	Saturday	-0.001	4.33	35.617	36.026	87.597	0.415
GE01	3/2/2019 2:55:12.759 PM	Saturday	-0.001	4.334	35.611	36.026	87.391	0.369
GE01	3/2/2019 2:56:12.759 PM	Saturday	-0.001	4.338	35.605	36.026	87.195	0.417
GE01	3/2/2019 2:57:12.759 PM	Saturday	-0.001	4.343	35.598	36.026	87.045	0.463
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GE01	3/2/2019 3:02:12.759 PM	Saturday	-0.001	4.364	35.567	36.026	86.310	0.462

☰ LK_WindFarm

Select Data > Modify View > Publish

Target Configuration

Westeros ▾

Run Mode

Run Once

Run on a Schedule

First Run

* 

Recur every 5 minutes

Summary

Shape and Matches

- There are 75 Matching Instances

Timeframe and Interval

- Your Start Time is *-1h
- Your End Time is *
- Your Time Interval gets an interpolated measurement Every 1 minute

Publish

Publicar en herramientas de BI, Data Warehouses, y Data Lakes para Algoritmos de Entrenamiento

La herramienta para contestar las preguntas anteriores es el PI System en conjunto con el conocimiento de la Operación



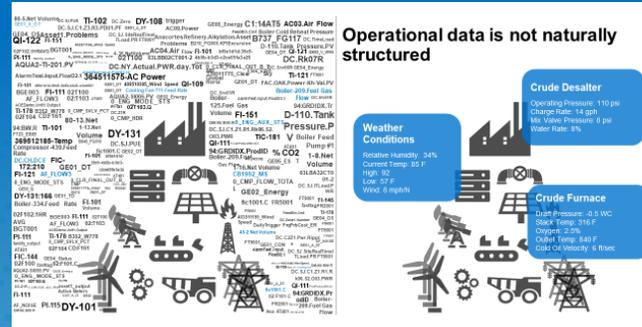
Gerente de planta
"¿Cuál es el factor de capacidad actual?"



Operador de la planta
"¿Qué ocurre durante el recorte de la turbina?"



Científico de datos
"¿Podemos predecir el fallo de un activo?"



Asset Framework

- Contextualizar
- Normalizar los modelos de datos



Event Frames

- Crear Eventos Discretos
- ## Asset Analytics
- Crear Cálculos Estándar

PI Integrators

- Limpiar y moldear los datos brutos

謝謝 KEA LEBOHA
 DZIĘKUJĘ CI TAPADH LEIBH 고맙습니다
 NGIYABONGA БАЯРЛАЛАА MISAOTRA ANAO
 TEŞEKKÜR EDERIM OBRIGADO شكرا SALAMAT
 DANKIE TERIMA KASIH DANKON TANK TAPADH LEAT
 KÖSZÖNÖM SPASIBO MULȚUMESC
 PAKMET CI3GE OSIssoft®
 GO RAIBH MAITH AGAT HVALA FAAFETAI
 БЛАГОДАРЯ GRACIAS ESKERRIK ASKO
 ТИ БЛАГОДАРАМ MAHADSANID HVALA ХВАЛА ВАМ
 TAK DANKE TEŞEKKÜR EDERIM
 RAHMAT MERCI DANKJE EΥΧΑΡΙΣΤΩ GRATIAS TIBI
 AČIŮ SALAMAT MAHALO IĀ 'OE TAKK SKALDU HA GRAZZI PAKKA PÉR
 HATUR NUHUN PAXMAT CAĠA ありがとうございました
 CẢM ƠN BẠN FALEMINDERIT SIPAS JI WERE TERIMA KASIH
 WAZVIITA TI БЛАГОДАРАМ ĐAKUJEM
 СИПОС MATUR NUWUN