

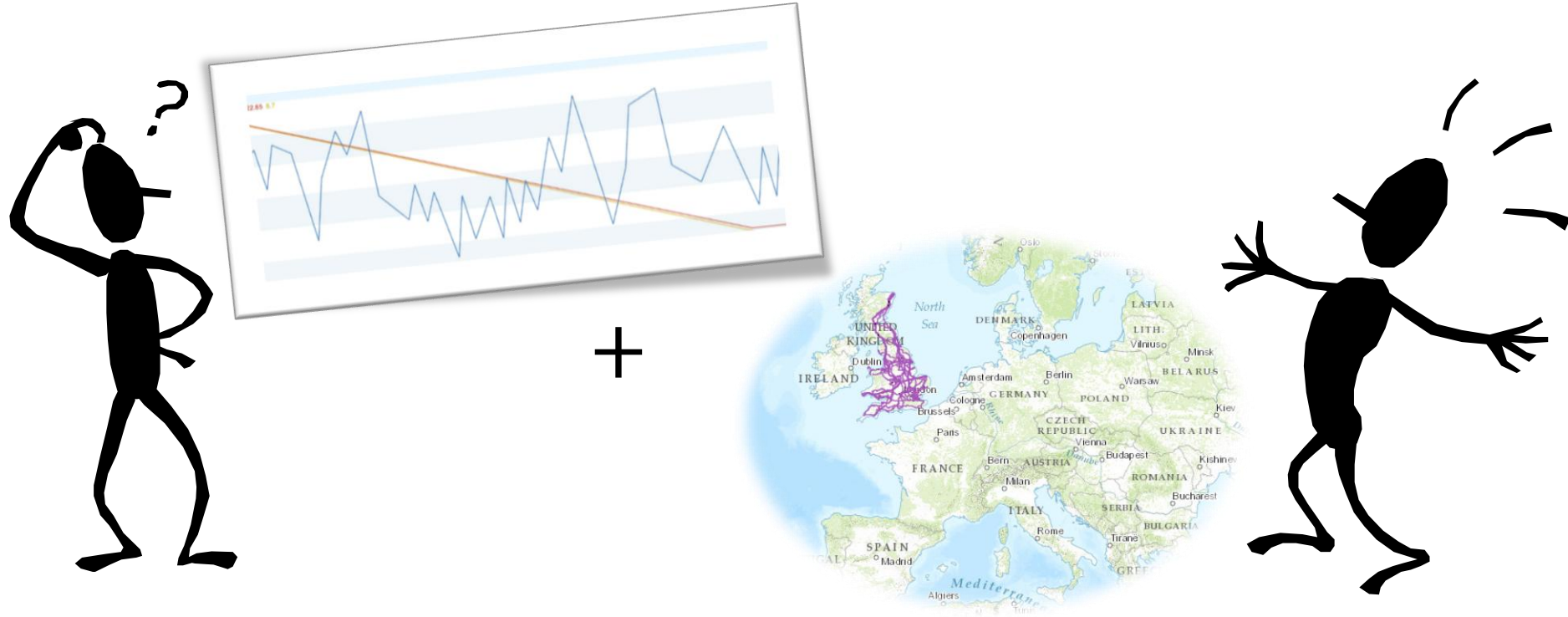
OSIsoft & Esri: PI System Integrator for Esri ArcGIS

Yves Gauthier, OSIsoft



Bringing Space & Time Together

Q. How can you better leverage sensor data combined with geography to gain new insights that improve your operations?



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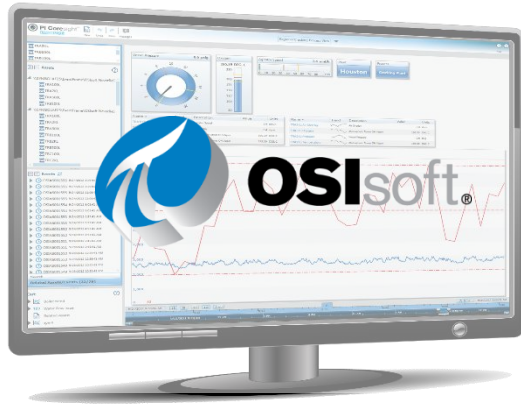
What could you do by combining sensor data with location?...by feeding real-time data into GIS?

- Improving **Operational Planning** and **Daily Activities**

- proactive network & asset management
- improving process & operational workflows
- tracking, reporting, & compliance

- Making **Immediate** and **Actionable Decisions**

- situational awareness for emergency response
- health, safety, and environment



Two Companies One Vision



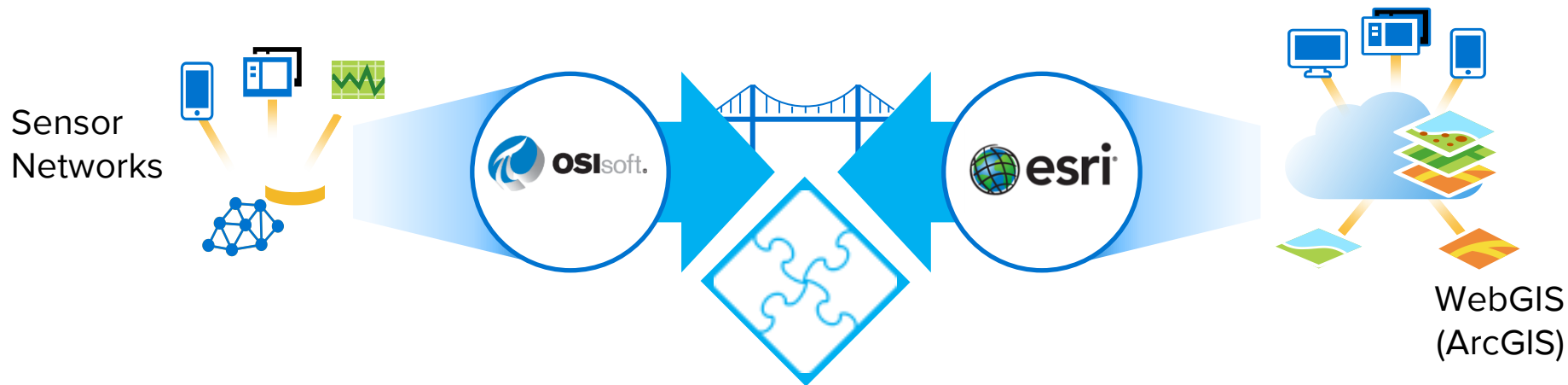


Real-time GIS



Two Companies One Vision: Bringing space & Time together

We believe data in the hands of smart people can create amazing insights, business improvements, and value



Past Integrations of Space & Time

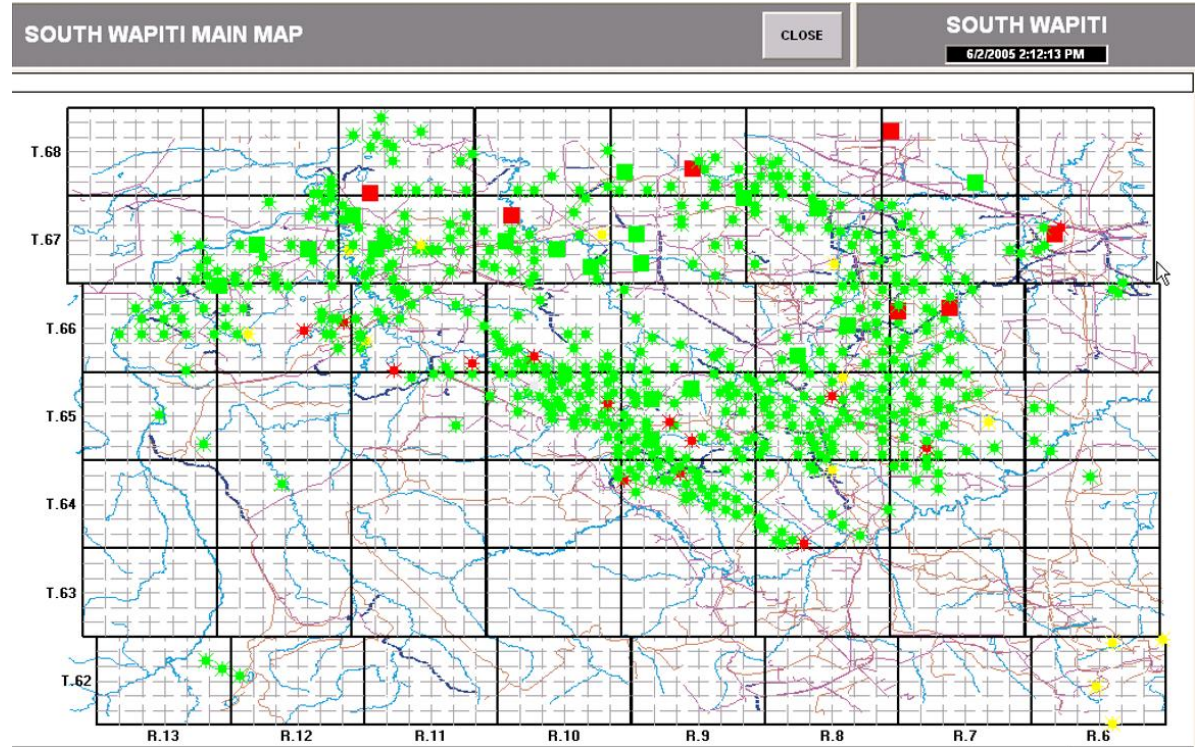


2005 OSIsoft Users Conference Presentation

Oil Field Analytics



- Reference: “Wapiti JV Data Transfer Project”
- BP Canada, Devon Canada, Mera Group

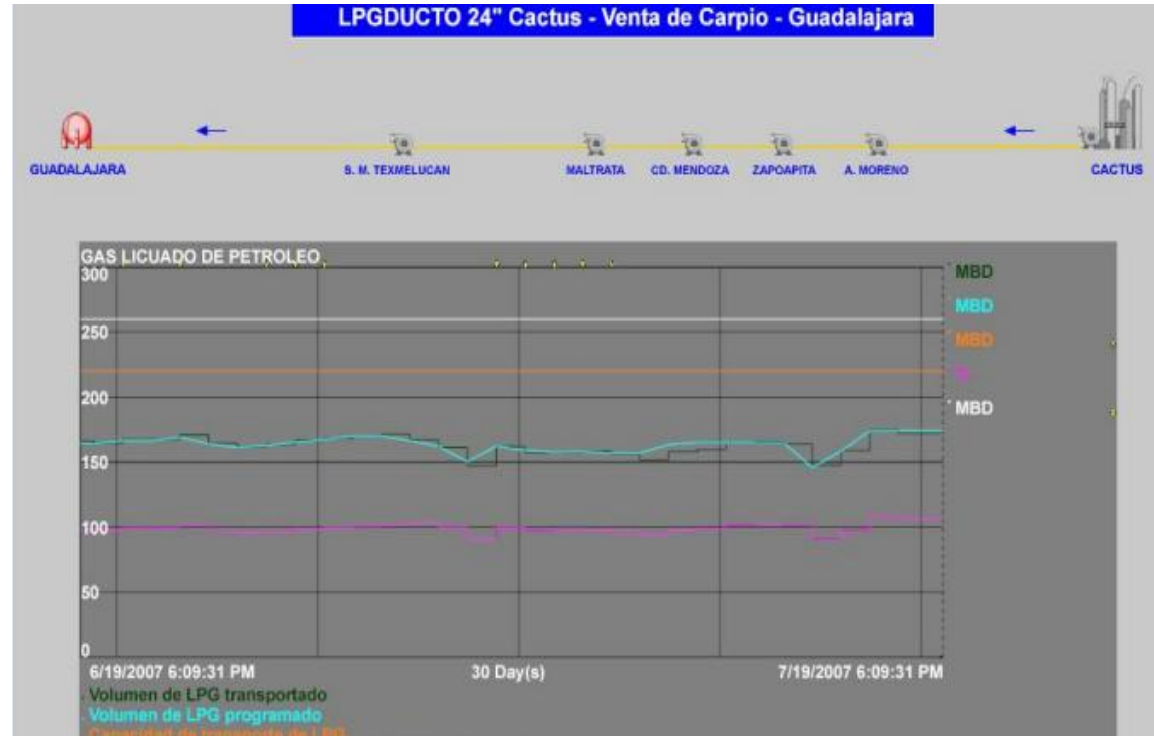


2007: OSIsoft Users Conference Presentation

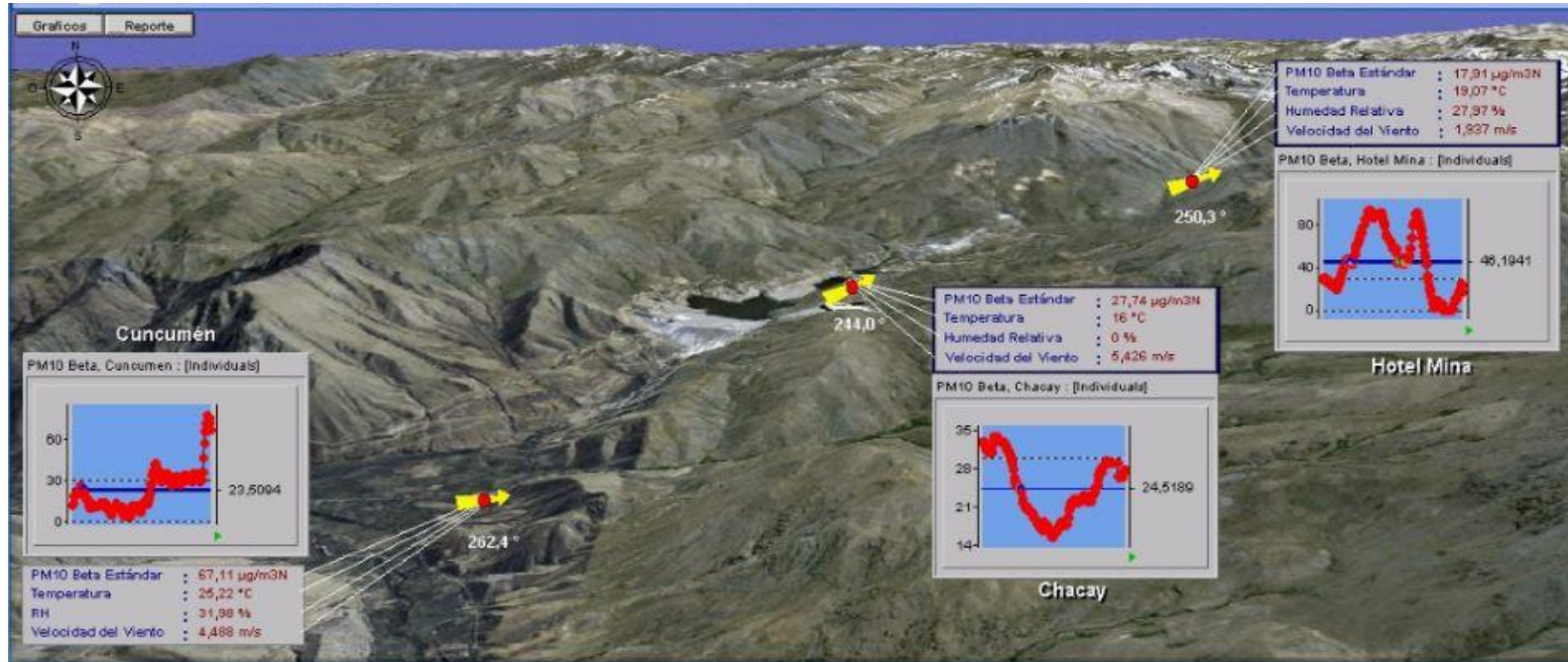
Oil & Gas “Pipelines Monitoring at Pemex”



- Don't always get the **real-time status** of equipment and **flows** on a map
- **Modeling pipeline** assets in the PI System was a **challenge**.



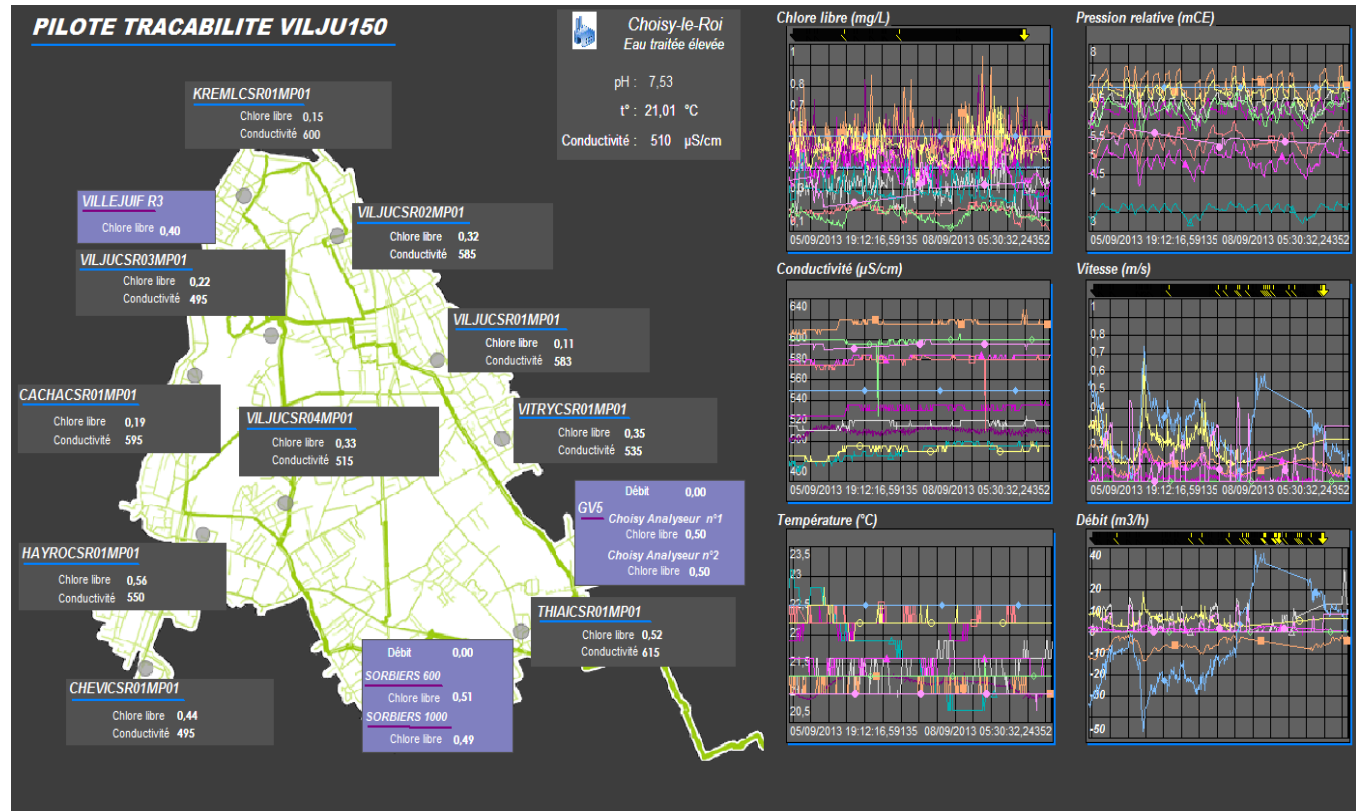
Mining: Particulates and Emissions Tracking



Veolia: 2014 OSIsoft Users Conference



- Reference: “How to build an innovative and Smart Water System with the PI System from OSIsoft”



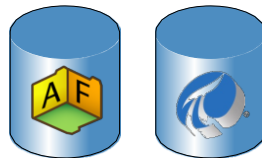
The PI System Integrator for Esri ArcGIS



What existed prior to the PI Integrator for Esri ArcGIS?

- Stand alone components
- Published SDKs

PI System

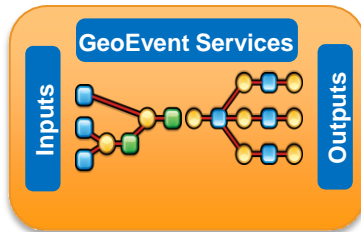


PI Coresight

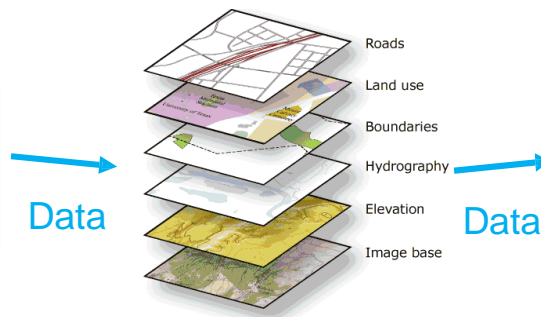


What have we developed?

Esri GeoEvent
Processor



Esri Feature Service
+ Esri Feature Layer



Esri Client
Tools



PI Integrator for ArcGIS

- Wizard-based configuration experience
- Ability to use the ArcGIS Asset listing to create the PI AF Element Structure
- Ability to invoke and embed PI Coresight displays from within ArcGIS

Configuration Portal Web App

The screenshot shows the 'Create new Geo Service' form in the PI Geo Services web app. The form includes fields for 'Name' and 'Description', both with placeholder text. Below these fields are two checkboxes: 'StreamServer' and 'DisplayServer', both of which are checked. A 'Create' button is located at the bottom of the form. The navigation bar at the top includes 'PI Geo Services', 'Home', 'Geo Services', and 'Administration'.

AF Asset Extractor

The screenshot shows the 'PI Asset Extractor for Esri ArcGIS' form. The title is 'PI Asset Extractor for Esri ArcGIS' with the subtitle 'Extract your Esri ArcGIS map features as PI AF assets'. The main section is 'Load features', which includes instructions: 'Read assets automatically from a Feature Layer URL. This should be an address to an ArcGIS Feature Layer, exposed via MapServer or FeatureServer. If you wish, it may include an Esri-designed query (to restrict elements, e.g. to only Wells in Texas)'. There is an 'Address' input field. Below the field, it says 'No features loaded yet' and 'Or, manually provide feature JSON (advanced) >>'. At the bottom are 'Apply' and 'Next' buttons. The navigation bar at the top includes 'PI Geo Services'.

PI Coresight Endpoint Creation

The screenshot shows the 'PI Coresight Endpoint Creation' form. The title is 'Layer SubsLeeward' with the subtitle 'Substations on the leeward coast'. It includes a 'Created on' timestamp. Below the title is a tabbed interface with 'All', 'Features', 'Fields', 'StreamServer', 'DisplayServer' (selected), and 'ArcGIS'. A message states 'This layer is exposed as a DisplayServer within the services directory'. The 'Configuration' section shows 'PI Coresight Server' set to 'dev-coresight'. There is a checkbox for 'Allow ad-hoc PI Coresight displays'. The 'Sharing' section shows 'Ad hoc display' set to 'https://esri.pigeo.pipreview.com/api/services/alohanuienergy/ai'. The 'AF Button Image' section shows a URL: 'https://esri.pigeo.pipreview.com/content/img/display/analyse-a'. The navigation bar at the top includes 'PI Geo Services', 'Services', 'Administration', 'Tools', and 'Help'.

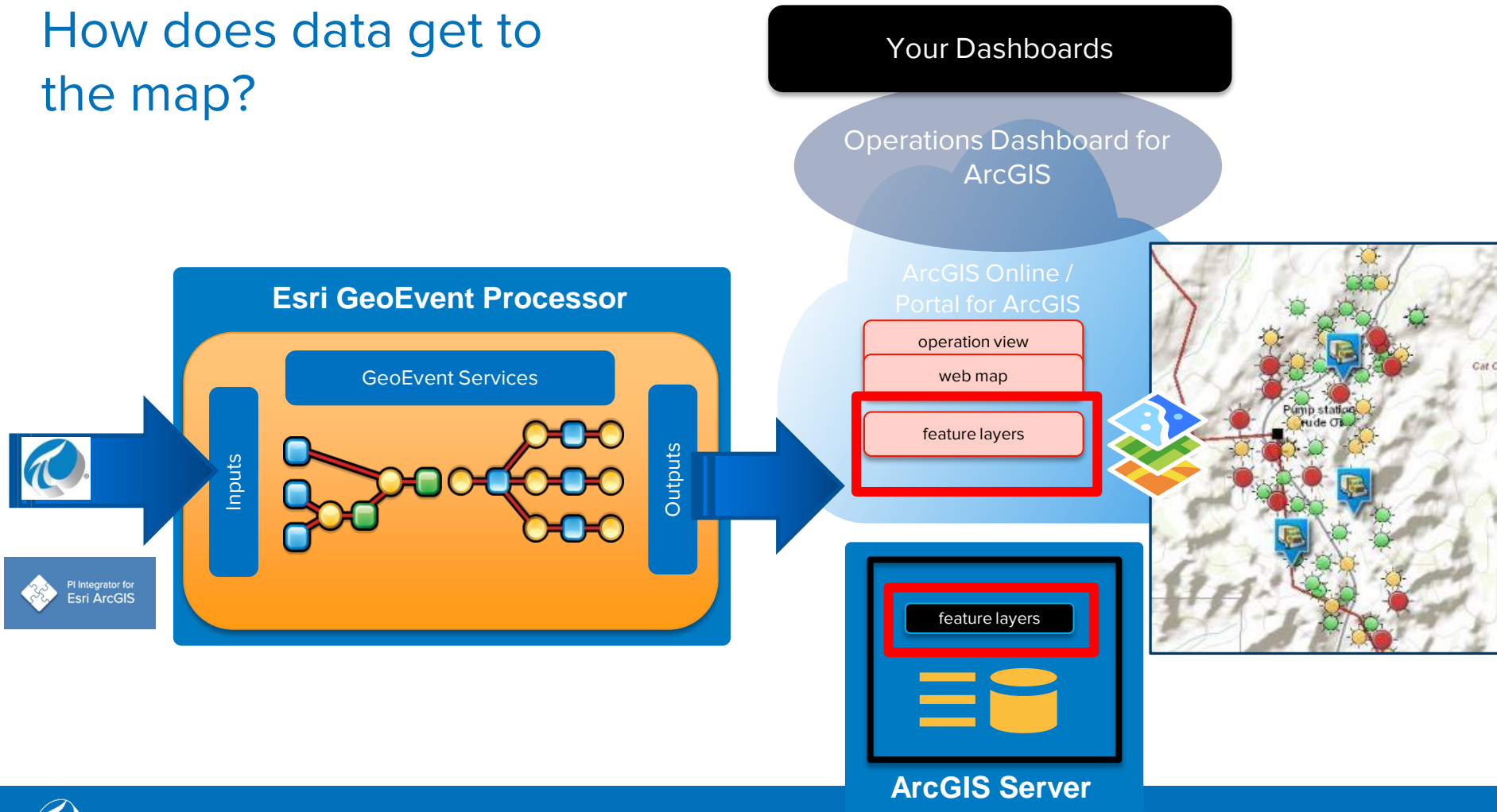


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How does data get to the map?



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Embed PI Coresight with ArcGIS Visualization

- Display Pop-ups OR
- In Esri ArcGIS Operations Dashboard

PI Coresight



PI Coresite Link inside of ArcGIS Pop-up



Esri Operations Dashboard



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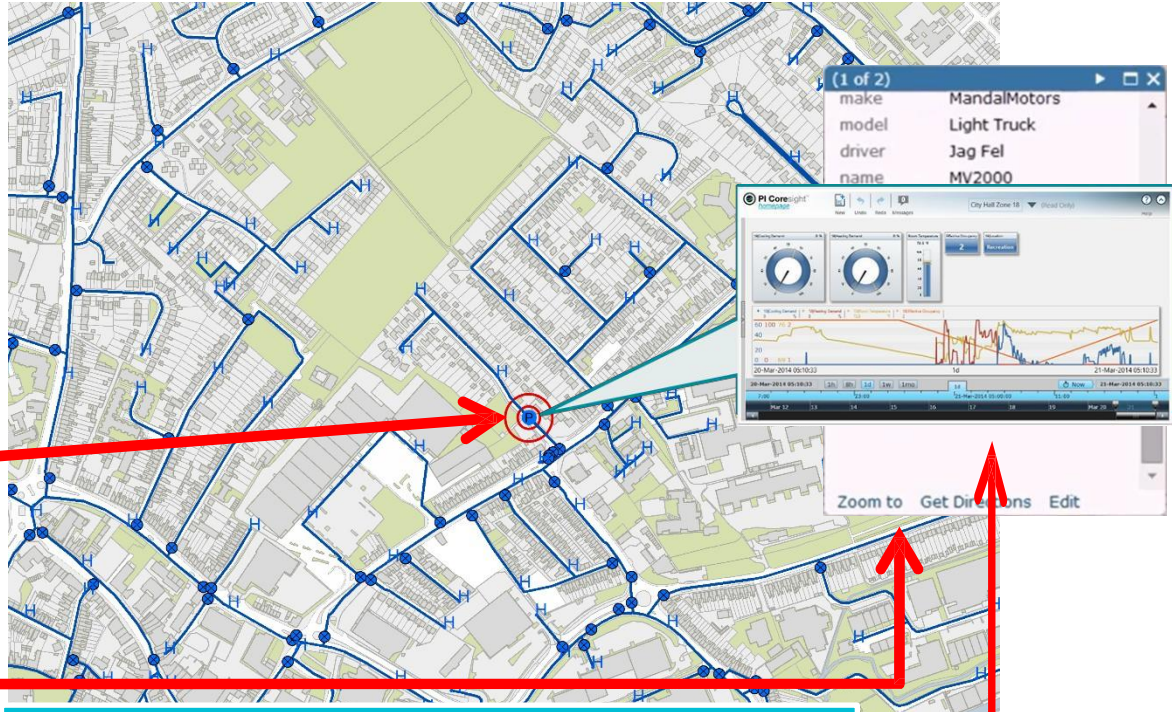
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Integrated Real-time Information



Operator clicks on
the Asset on GIS
display

Real-time
information from
the PI System for
this Asset is
displayed



Further information is available -
single click to access



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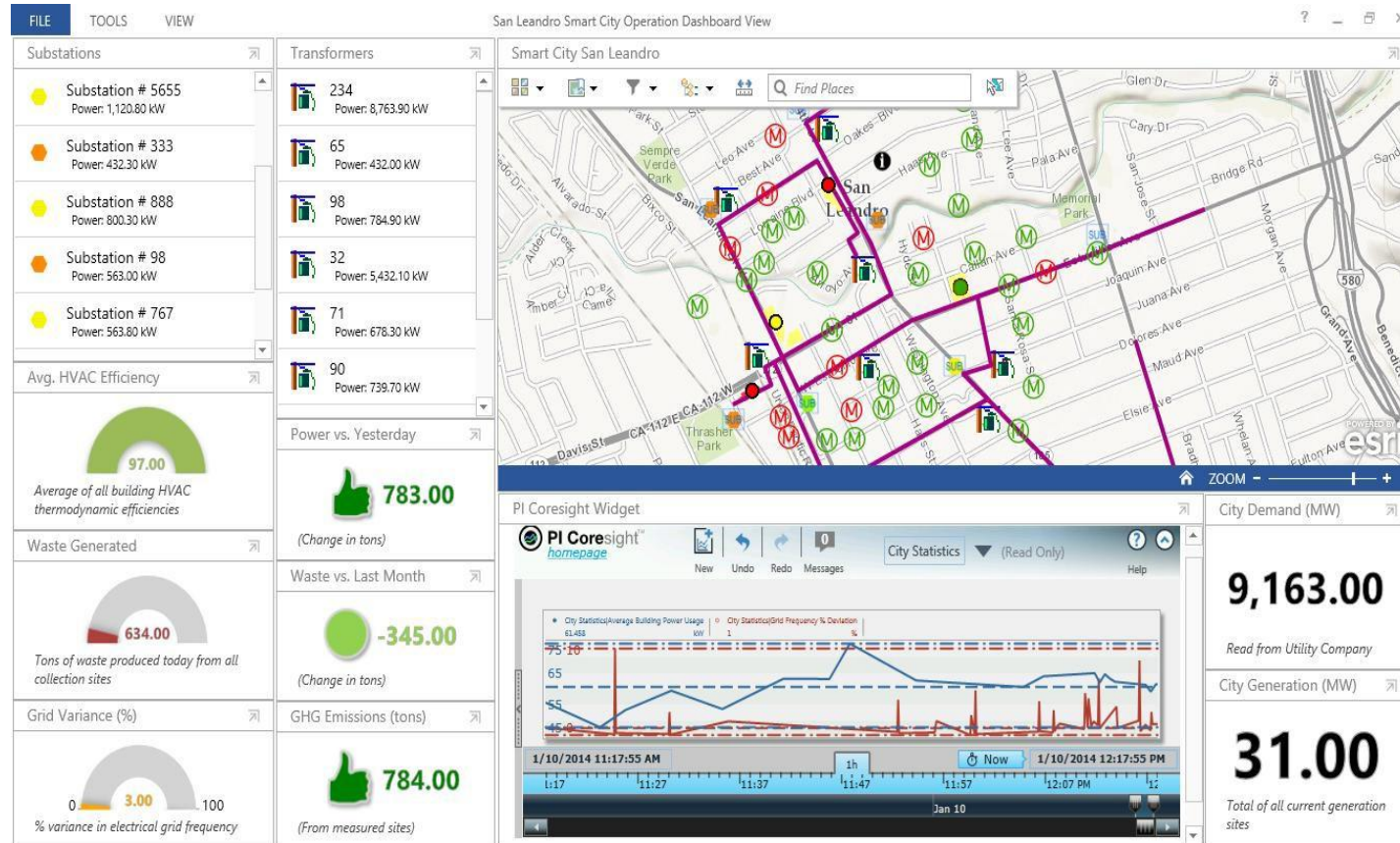
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Use Cases:

**What are companies doing with
PI System & ArcGIS?**



Operational Performance View

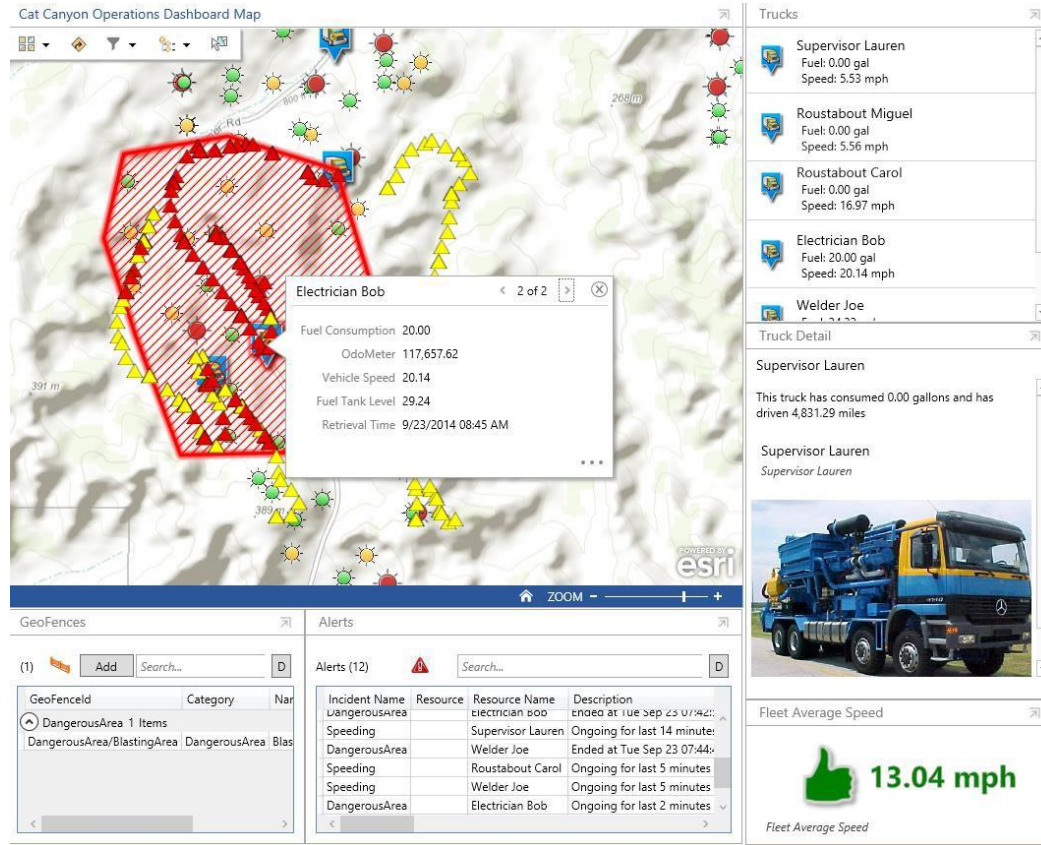


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Worker dispatch

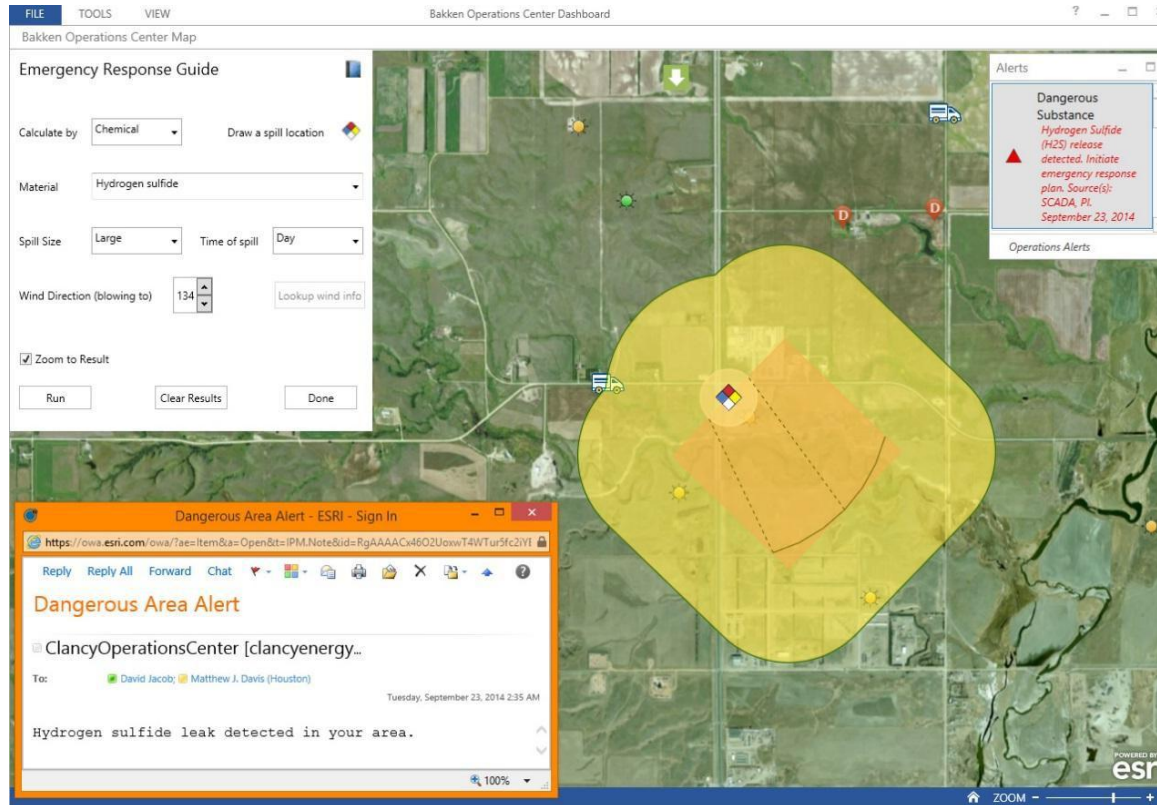


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Environmental Health & Safety

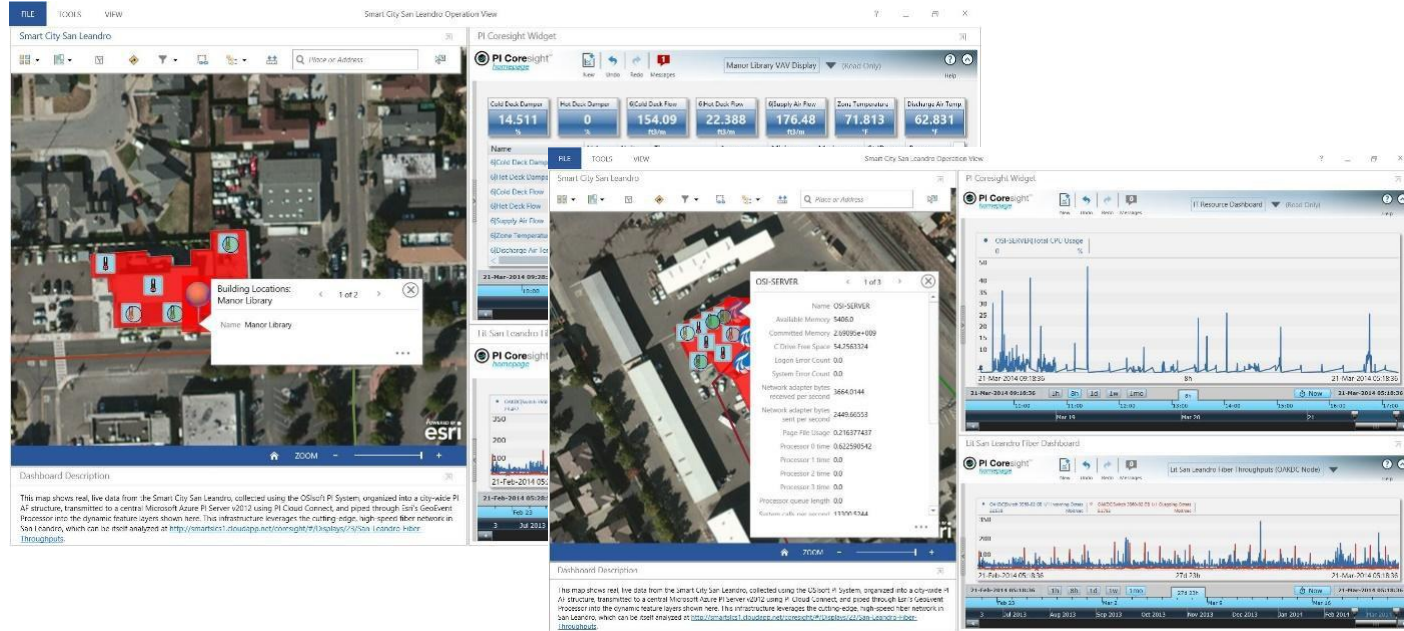


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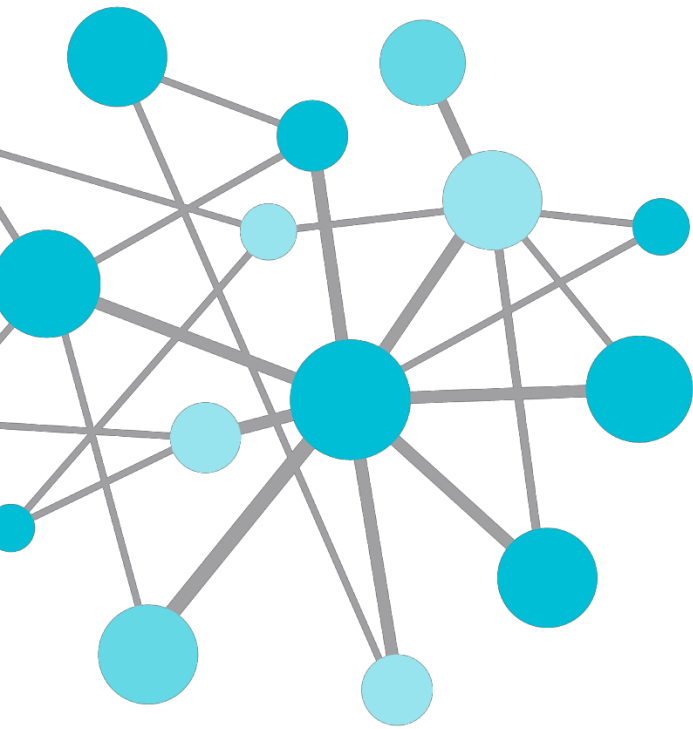
Facilities & Energy Management



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Improving Real-time and Spatial Decision Making by Combining the PI System with Esri ArcGIS

DONG
energy



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DONG Energy has a Strategic Focus on Offshore Wind

DONG Energy will have 6.5 GW installed capacity from approx. 1.800 offshore wind turbines in 2020

Offshore Wind

Market leadership; growth and value creation

Priorities

- Mature and construct project pipeline
- Reduce cost of energy
- Further develop industrial and financial partnerships
- Standardise and increase operational efficiency

Targets

- Installed gross capacity of 6.5GW in 2020
- Offshore cost-of-energy below €100/MWh in 2020¹
- ROCE of 6-8% by 2016; 12-14% by 2020



Strategic focus

OFFSHORE WIND

DONG Energy capacity¹
GW



- Fastest growing renewable
- Market leader
- High share of regulated income
- Solid returns



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HSE and OPEX cost are top of mind in DONG Energy

Transfer from crew vessels to wind turbine boat landings is the most dangerous operation in offshore wind
Working offshore is 15 times more expensive compared to similar work onshore

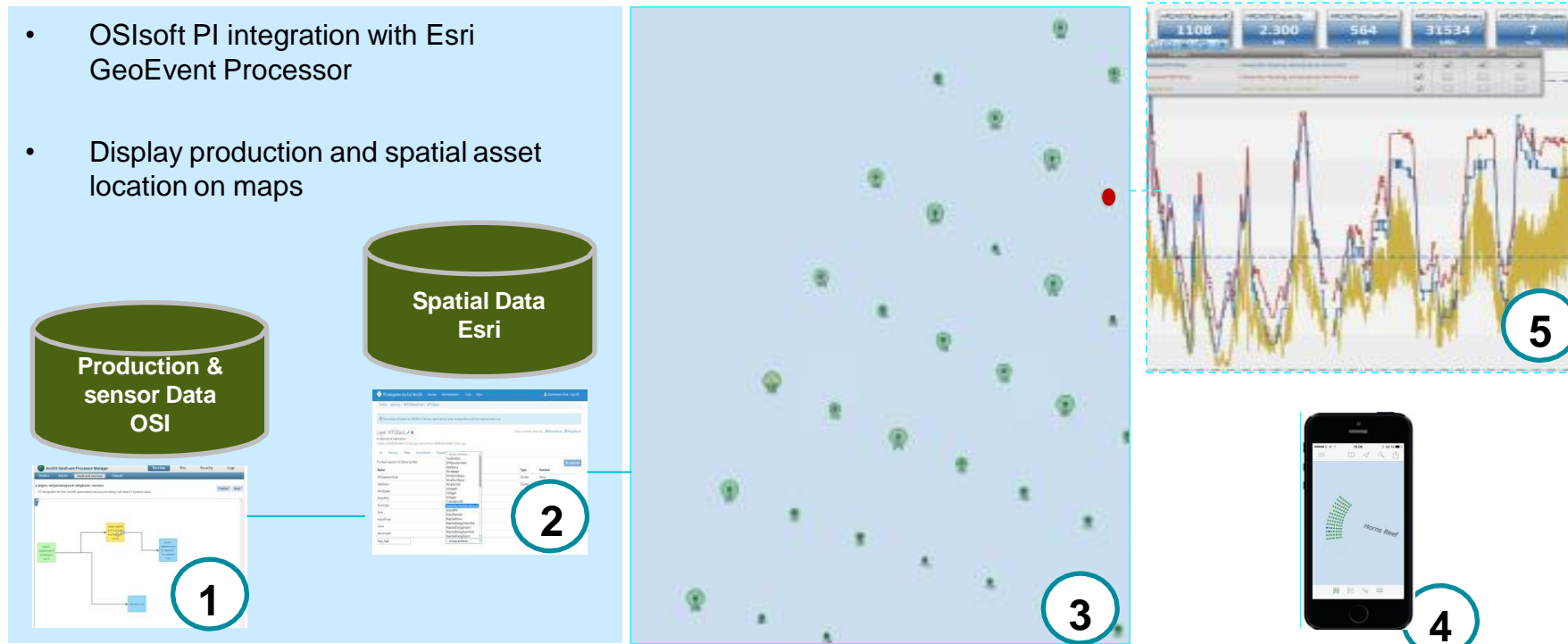
- Working offshore is one of the most dangerous workplaces in the world and any offshore organisation must have a strong focus on HSE
- Offshore activities are 15 times more costly than similar onshore activities and should be avoided if possible
- Lost production can be avoided by better logistical planning through access to production and spatial data on a map



Portfolio Overview of through OSIsoft and Esri platforms

Will reduce HSE risk and OPEX cost through improved asset integrity

- OSIsoft PI integration with Esri GeoEvent Processor
- Display production and spatial asset location on maps



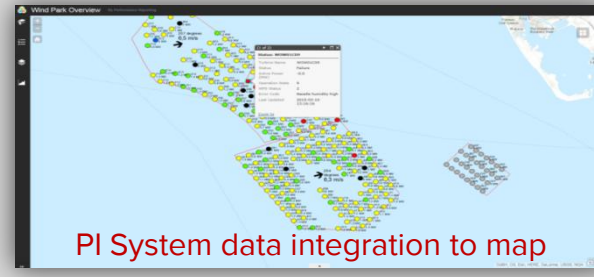
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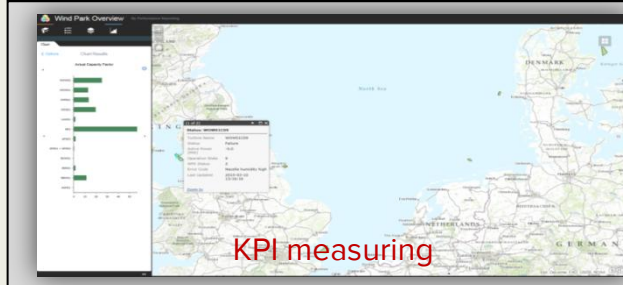
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OSIsoft is used for monitoring park status and accessing critical park information on park and portfolio level

Site Management



Portfolio Management



Challenges

- Standardization
- Stability
- Scalability

Solution

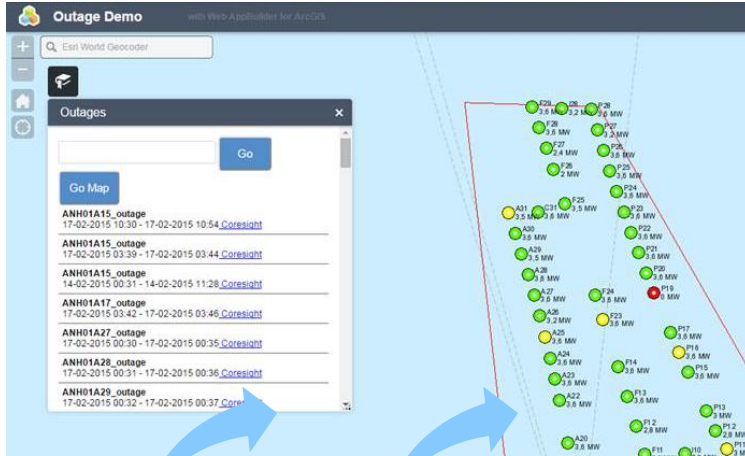
- OSIsoft PI System and Esri ArcGIS integration

Key benefits

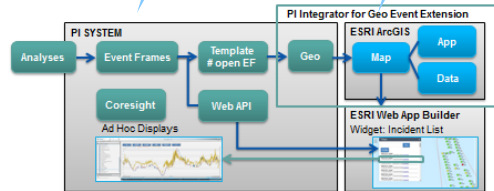
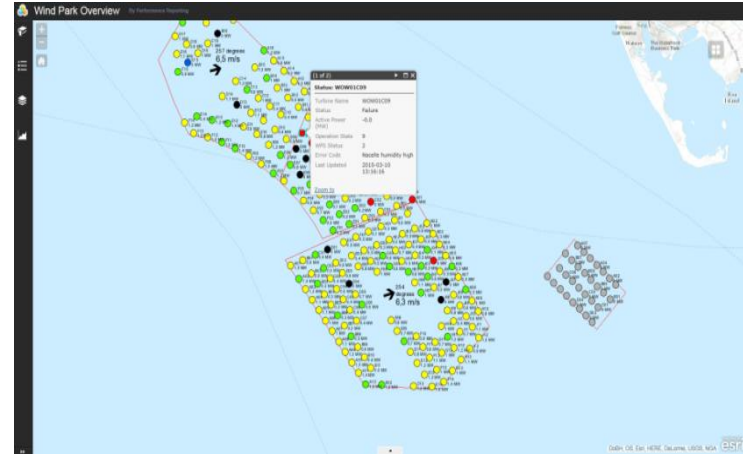
- Visualization of performance
- Awareness and Responsiveness
- System stability
- One point for entry (Simplicity)

From architectural vision to business applications

In development...



In production...



Events through WebAPI

Deep links to CoreSight

PI Integrator for PI data in Esri maps

Weather info

Vessel locations

Near real time production KPI's

Improved planning through spatial overview

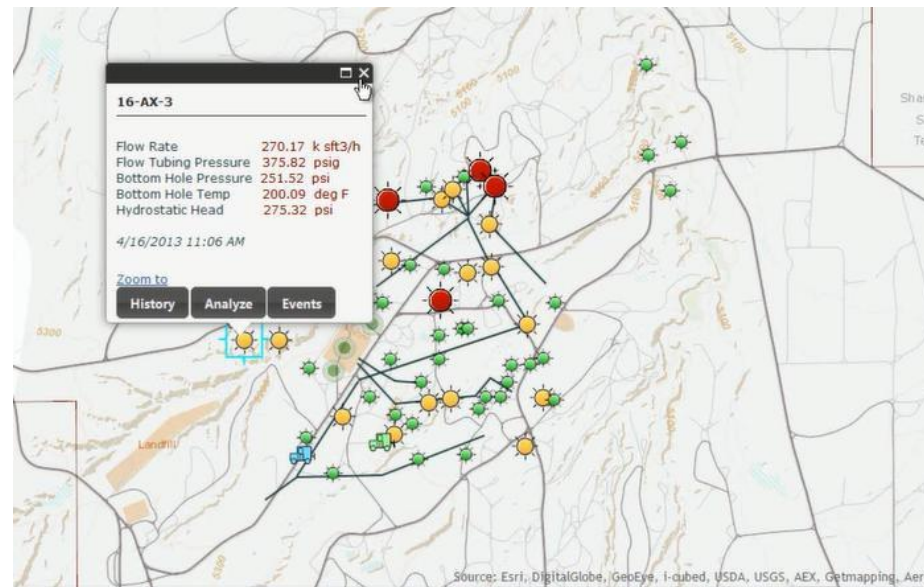
4 unscheduled visits lowered to 2 per turbine / year will moderate HSE risk significant in offshore activities and reduce OPEX cost with ~20 EURm / year (NPV)

- Asset integrity improvements will reduce the total number of unscheduled visits to 1.800 offshore wind turbines in 2020
- Avoiding offshore maintenance visits due to better asset integrity and operational transparency will reduce HSE risk



PI & Esri Integration value for O&G Companies

- Situational Awareness
- Operational Excellence
- Reliability
- Asset Performance monitoring
- Condition based maintenance
- Maintenance Planning & Logistics
- Linear Asset Modeling (e.g. transmission lines, pipelines, rail, etc)
- Monitor Distributed Mobile Assets
- Regulatory Compliance
- Environmental, Health & Safety



Video: PI System & Esri Integration for Oil & Gas



Summary: PI Integrator for Esri ArcGIS

1. Simplified Configurable & Integration
2. Deliver real-time data across the organization on any device, any app, any time
3. Designed for non-technical users
4. Increase speed of deployment
5. Global support at enterprise scale
6. Provides greater agility to meet evolving business needs

Please visit demo pods in lobby



Thank You



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