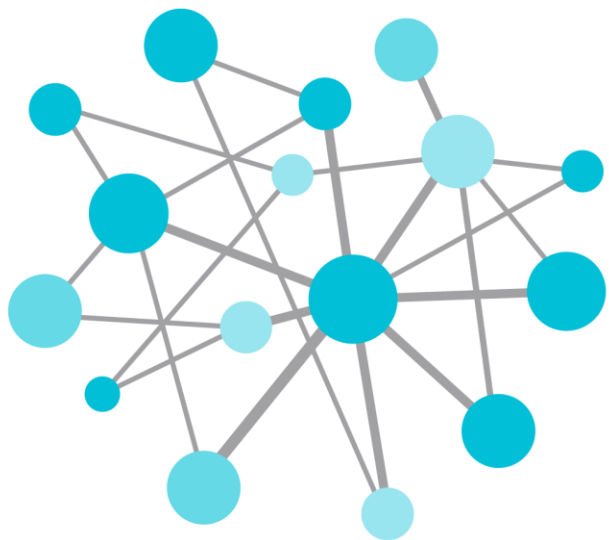


# **Put Yourself on the Map: The Fusion of the PI System & Esri ArcGIS**

Presented by

**Danny Spillmann, Director Global Energy, Esri Inc.**  
**Stewart Young, Global Alliance Manager, OSIsoft LLC.**  
**Anders Røpke, Lead Data Architect, Dong Energy DK**



OSIsoft<sup>®</sup>

# USERS 2014

## CONFERENCE

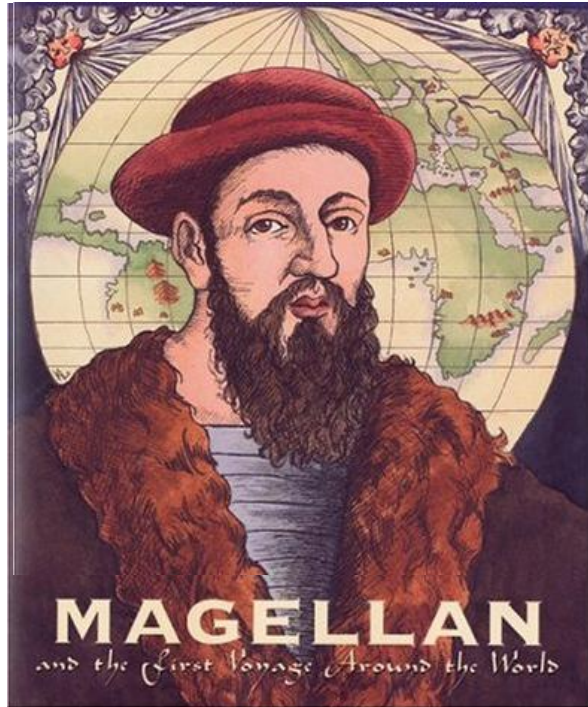
The **Power** of **Data**

**E M E A**



DECISION READY IN REAL-TIME

# Who is this man? What did he achieve?



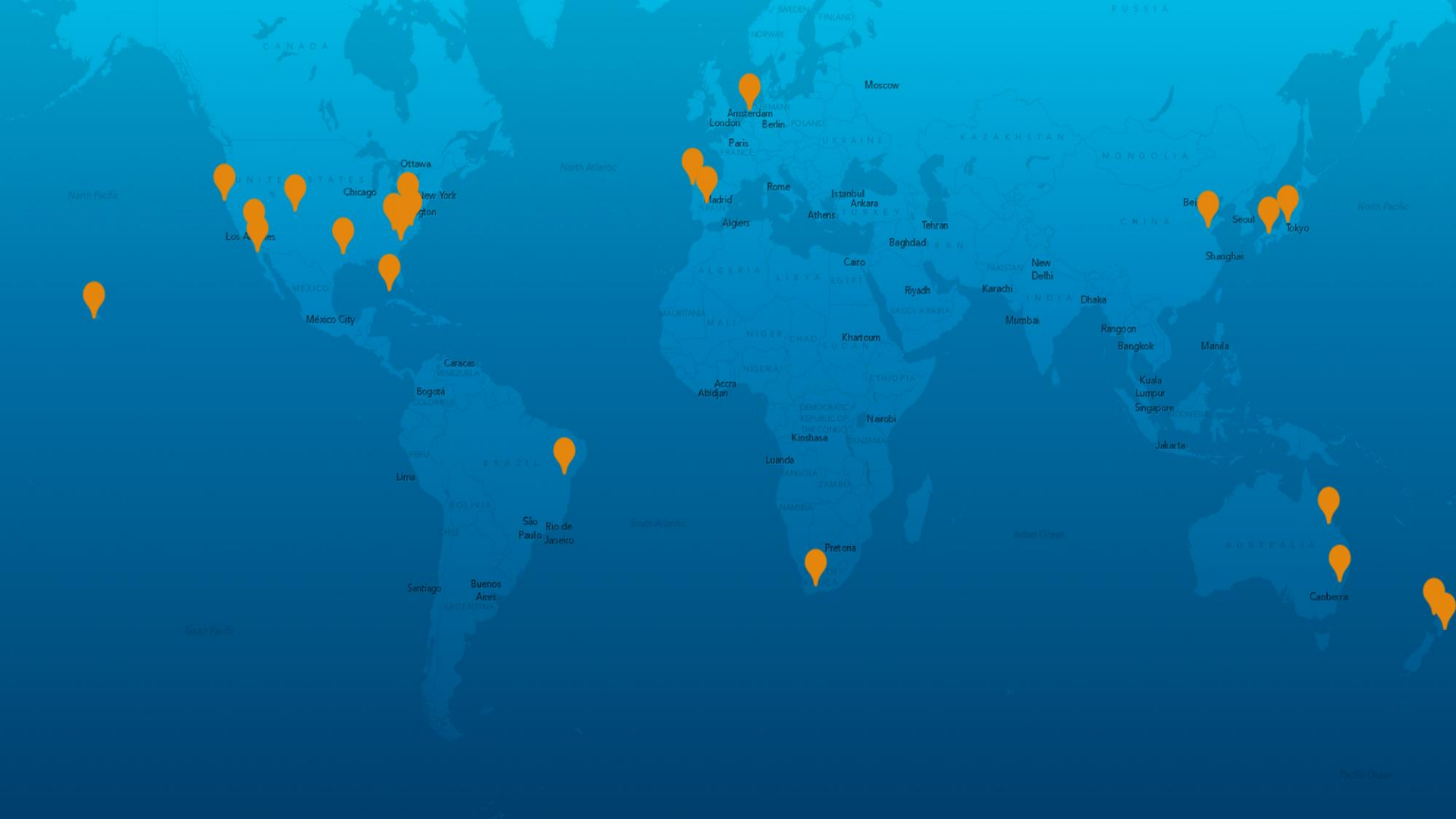


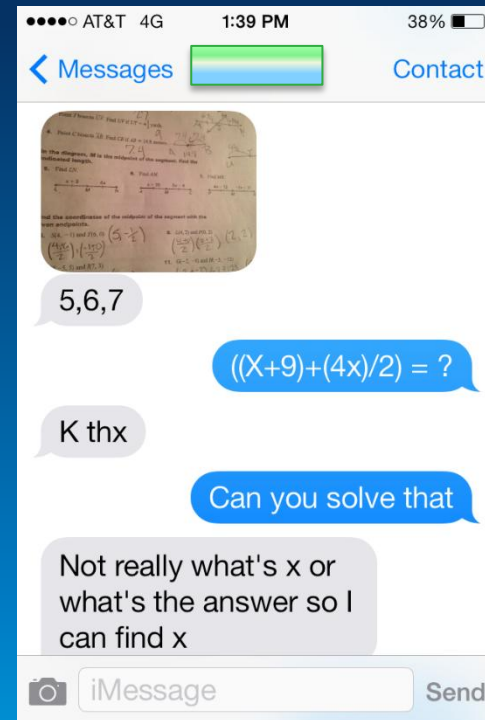
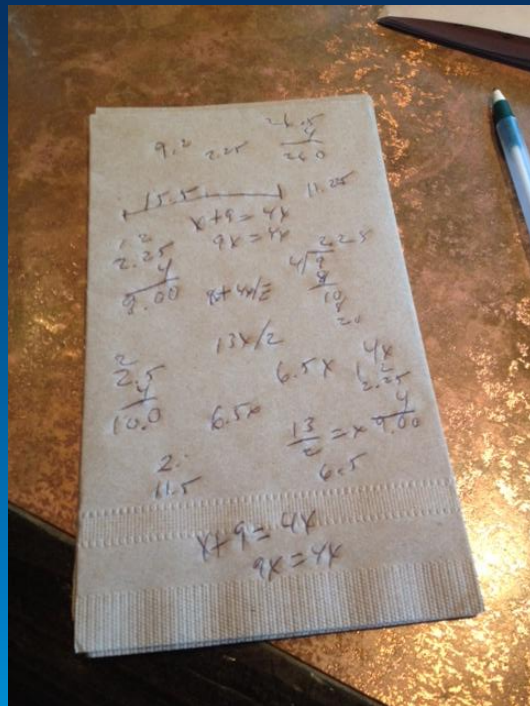
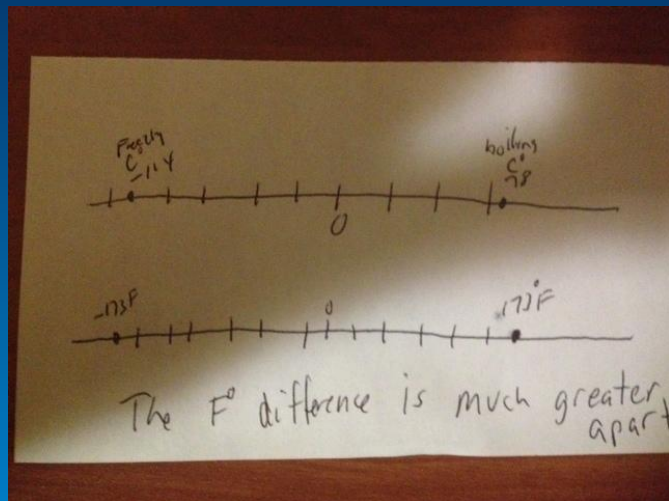
# GIS and Real Time Data

Bringing Together Space and Time

Transforming How We Understand and Manage Our Organizations







Homework Never Ends

Any Device, Any Where, Any Time

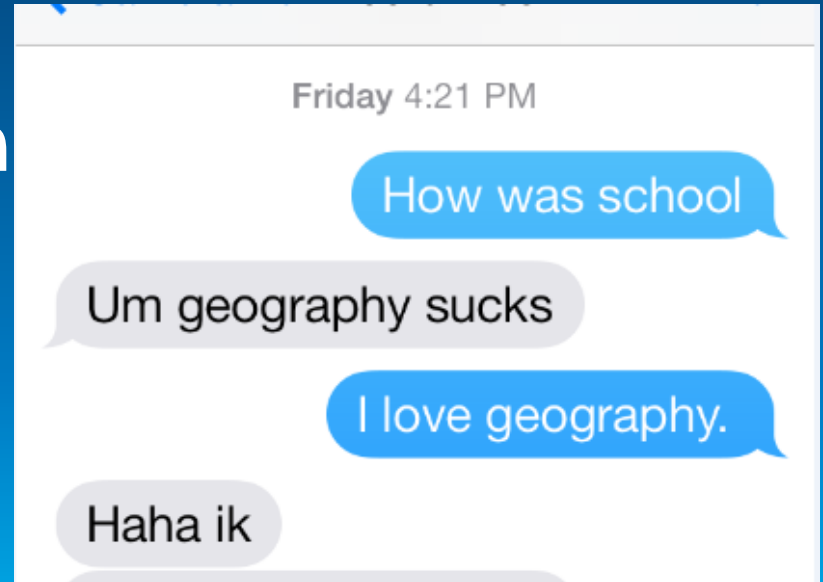
# Geography

**Problem – I need to make a map using the five themes of Geography.....**

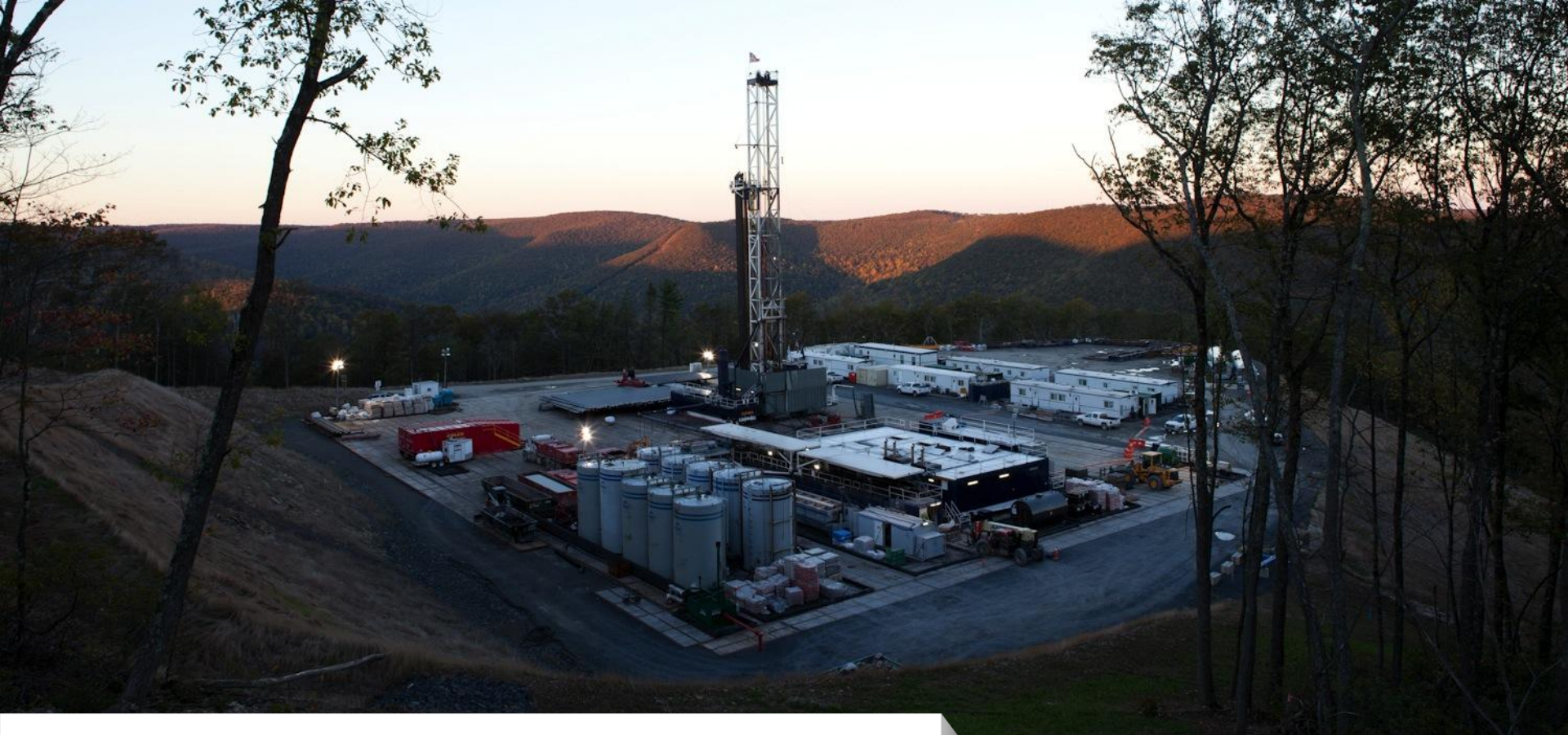


# THE FIVE THEMES OF GEOGRAPHY

1. Location
2. Place
3. Human-Environment Interaction
4. Movement
5. Regions







**Seneca Resources Corporation**

Location is Key to their Business



**Location** is **critical** to  
your **operations**

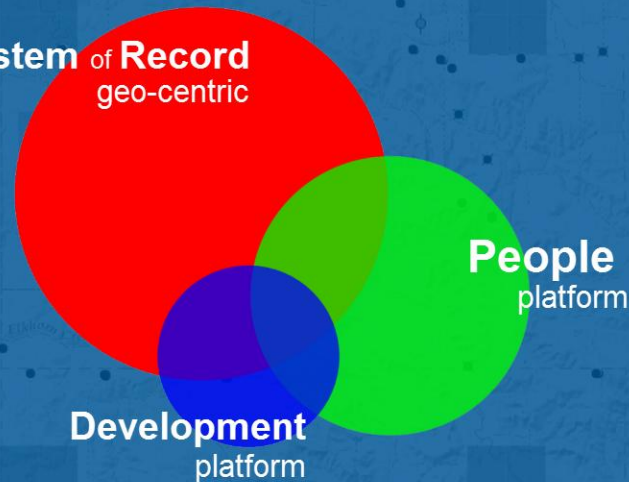


Every hour your company makes  
**location based decisions**



**Location** is key to **business**  
**continuity** and **risk mitigation**

**System of Record**  
geo-centric



**Supporting Your Business**

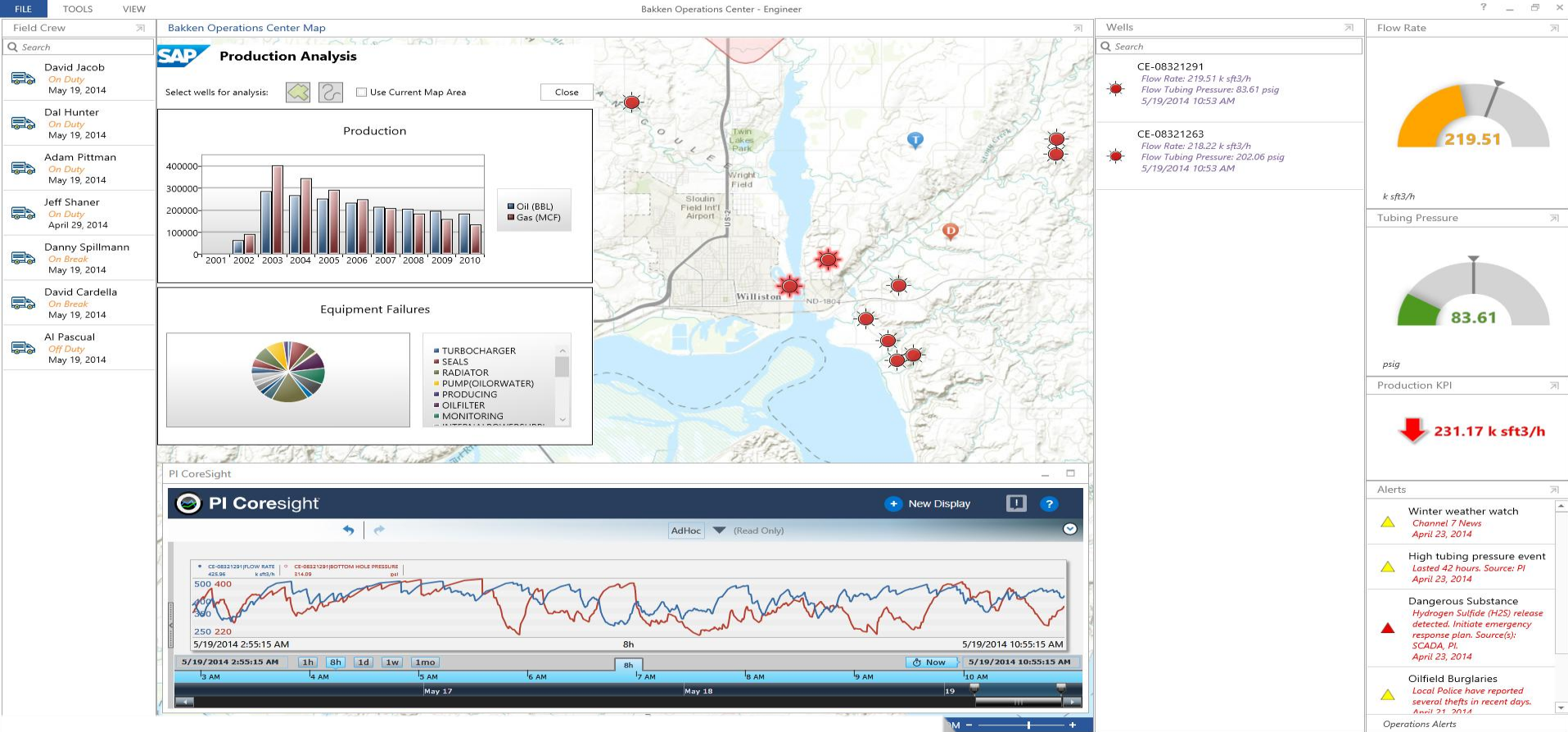
The location system of record



**Usable | Actionable | Accountable**

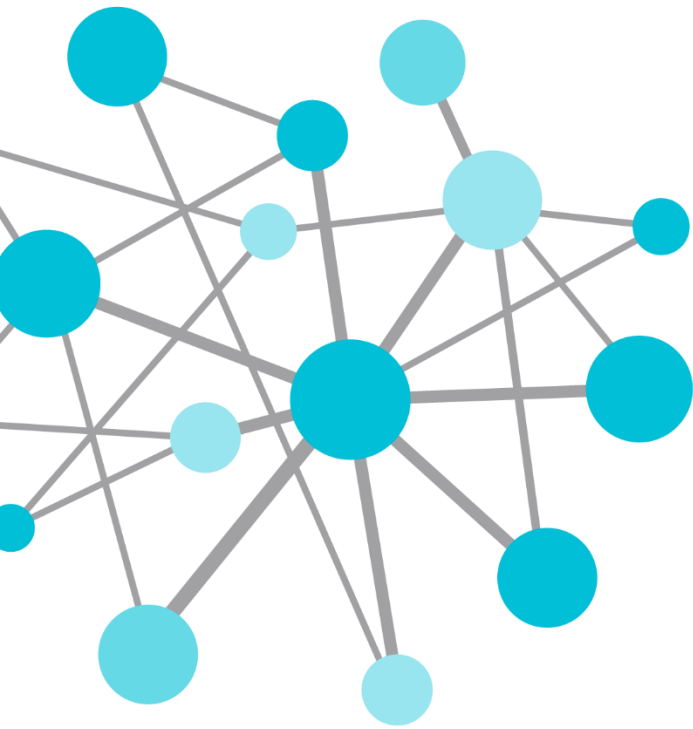
A strategy for making actionable decisions as an organization





Connecting your Enterprise

Integrating with key business systems



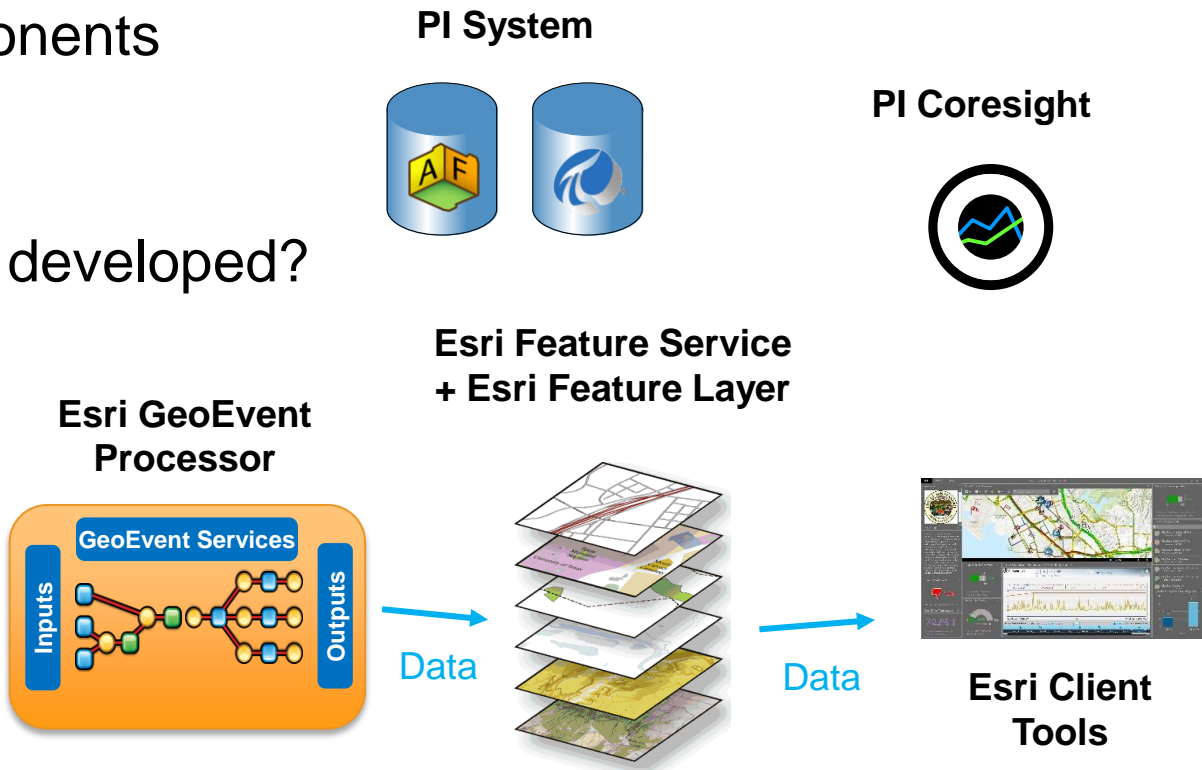
**Let's take a look at  
the PI Integrator for  
Esri ArcGIS and  
some examples**



# What existed prior to the PI Integrator for Esri ArcGIS?

- Stand alone components
- Published SDKs

What exactly have we developed?



# What we have developed?

- 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



PI Geo Services Home Geo Services Administration

home / services / new

### Create new Geo Service

**Name**

**Description**

☒ StreamServer

☒ DisplayServer

## AF Asset Extractor

PI Geo Services

### PI Asset Extractor for Esri ArcGIS

Extract your Esri ArcGIS map features as PI AF assets

#### Load features

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).

**Address**

No features loaded yet

Or, manually provide feature JSON (advanced) >>

## PI Coresight Endpoint Creation

PI Geo Services Services Administration Tools Help

home / services / AlohaNuiEnergy / SubsLeeward

### Layer SubsLeeward

Substations on the leeward coast

Created on 05/01/2014 07:52:16 (2014-05-01T19:52:16Z)

All Features Fields StreamServer **DisplayServer** ArcGIS

This layer is exposed as a DisplayServer within the services directory

#### Configuration

**PI Coresight Server**

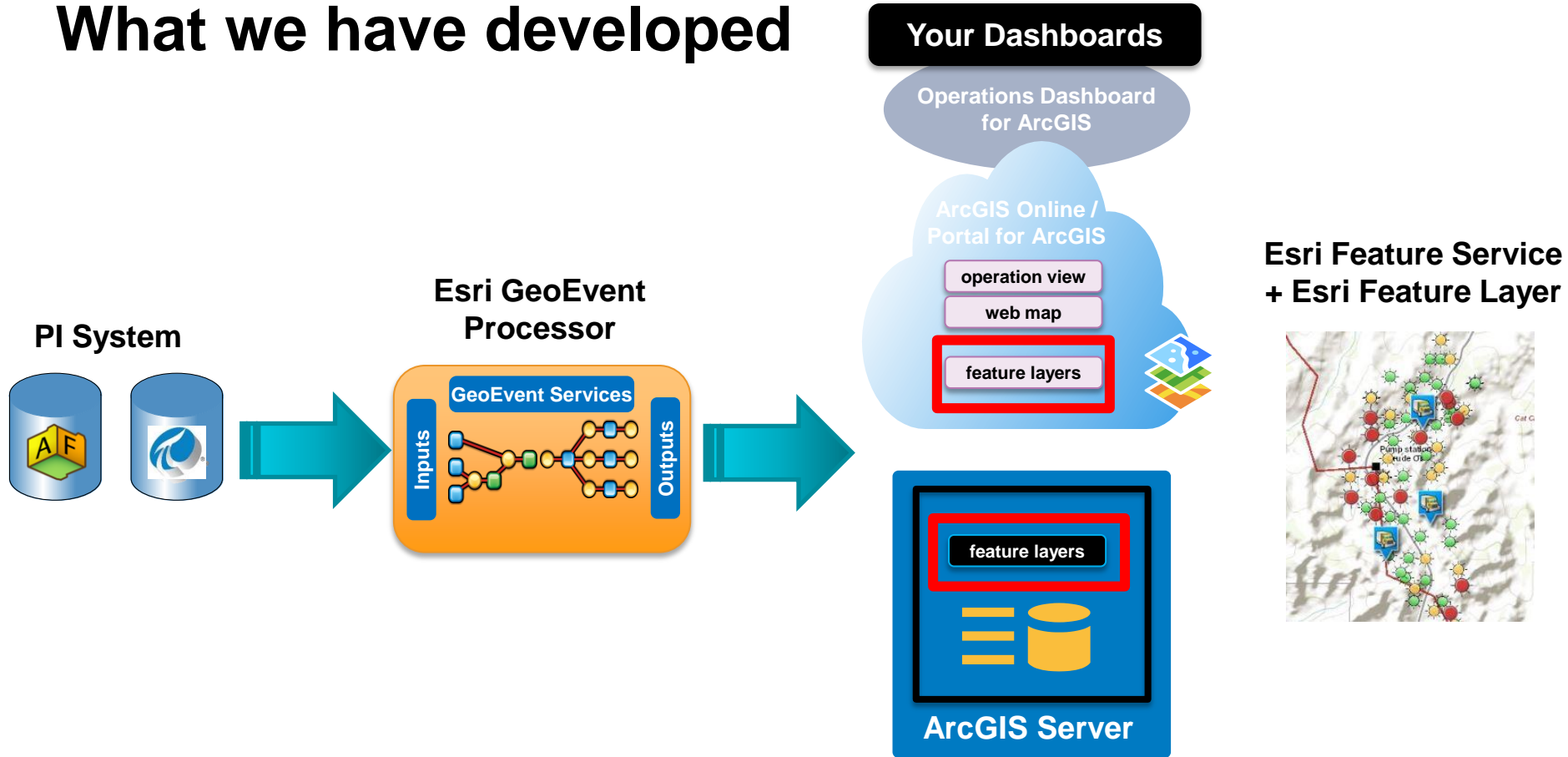
☒ Allow ad-hoc PI Coresight displays

#### Sharing

Ad hoc display

AF Button Image

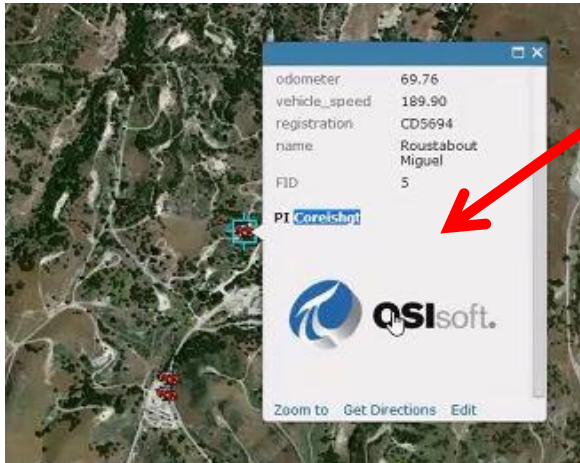
# What we have developed



# Embed PI Coresight in to ArcGIS Visualization

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

PI Coresight



PI Coresite Link inside of ArcGIS Pop-up



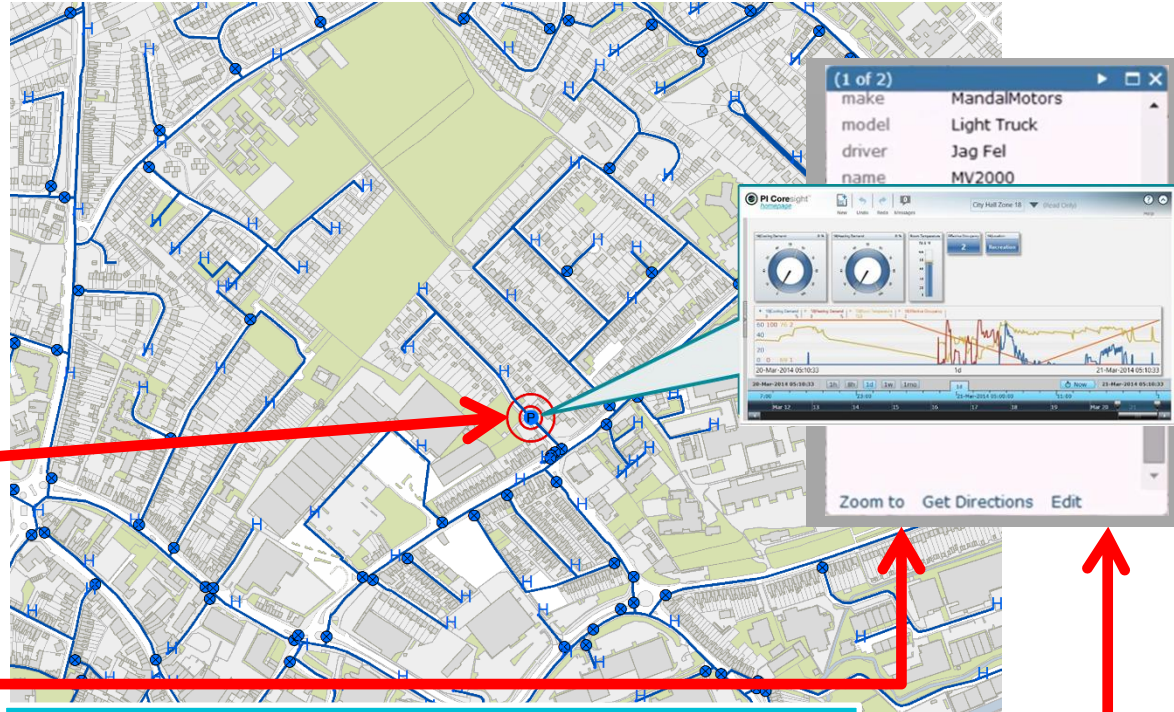
Esri Operations Dashboard

# 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



# What are Utilities doing with PI System and ArcGIS?

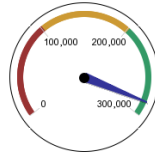
Location Analytics

## AMI Inventory Daily Status Report

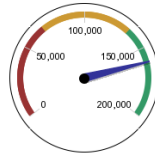
### Collectors by Total Meters Not Responding

Collector ID	Number of Reporting Meters (Sum)	Total Days Since Last Report	Total Meters Not Responding
He56125G76124	276	5	41
He56124G76123	160	0	15
He56108G76107	134	2	9
He56106G76105	123	3	5
He56122G76121	74	1	3
He56107G76106	50	3	1
He56100G7699	48	0	0
He56101G76100	94	0	0
He56102G76101	47	0	0
He56103G76102	27	0	0
He56104G76103	148	6	0
He56105G76104	81	0	0
He56109G76108	63	5	0
He5610G769	172	0	0
He56110G76109	99	0	0
He56111G76110	146	0	0
He56112G76111	33	0	0
He56113G76112	79	0	0
He56114G76113	70	0	0
He56115G76114	176	0	0

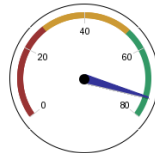
### Total Transmissions Sent



### Total Transmission Errors



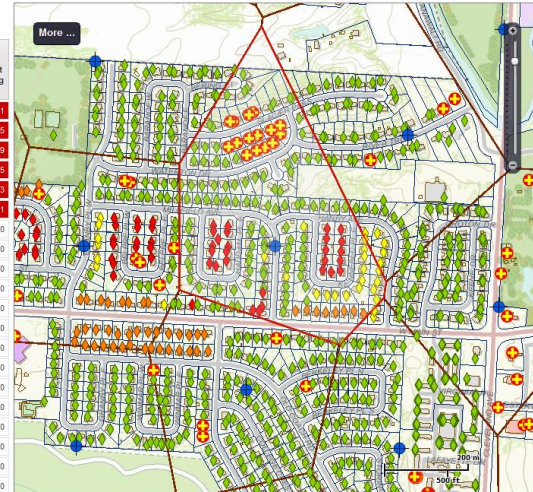
### Total Meters Not Reporting



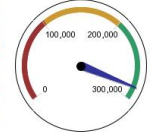
## AMI Inventory Daily Status Report

### Collectors by Total Meters Not Responding

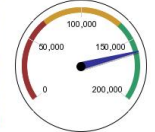
Collector ID	Number of Reporting Meters (Sum)	Total Days Since Last Report	Total Meters Not Responding
He56125G76124	276	5	41
He56124G76123	160	0	15
He56108G76107	134	2	9
He56106G76105	123	3	5
He56122G76121	74	1	3
He56107G76106	50	3	1
He56100G7699	48	0	0
He56101G76100	94	0	0
He56102G76101	47	0	0
He56103G76102	27	0	0
He56104G76103	148	6	0
He56105G76104	81	0	0
He56109G76108	63	5	0
He5610G769	172	0	0
He56110G76109	99	0	0
He56111G76110	146	0	0
He56112G76111	33	0	0
He56113G76112	79	0	0
He56114G76113	70	0	0
He56115G76114	176	0	0



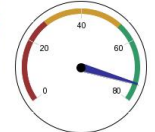
### Total Transmissions Sent



### Total Transmission Errors



### Total Meters Not Reporting



### Meters by Days Since Last Report

- Not Reporting
- <= 1 Day(s)
- 1 - 3 Days
- 3 - 4 Days
- >= 4 Days

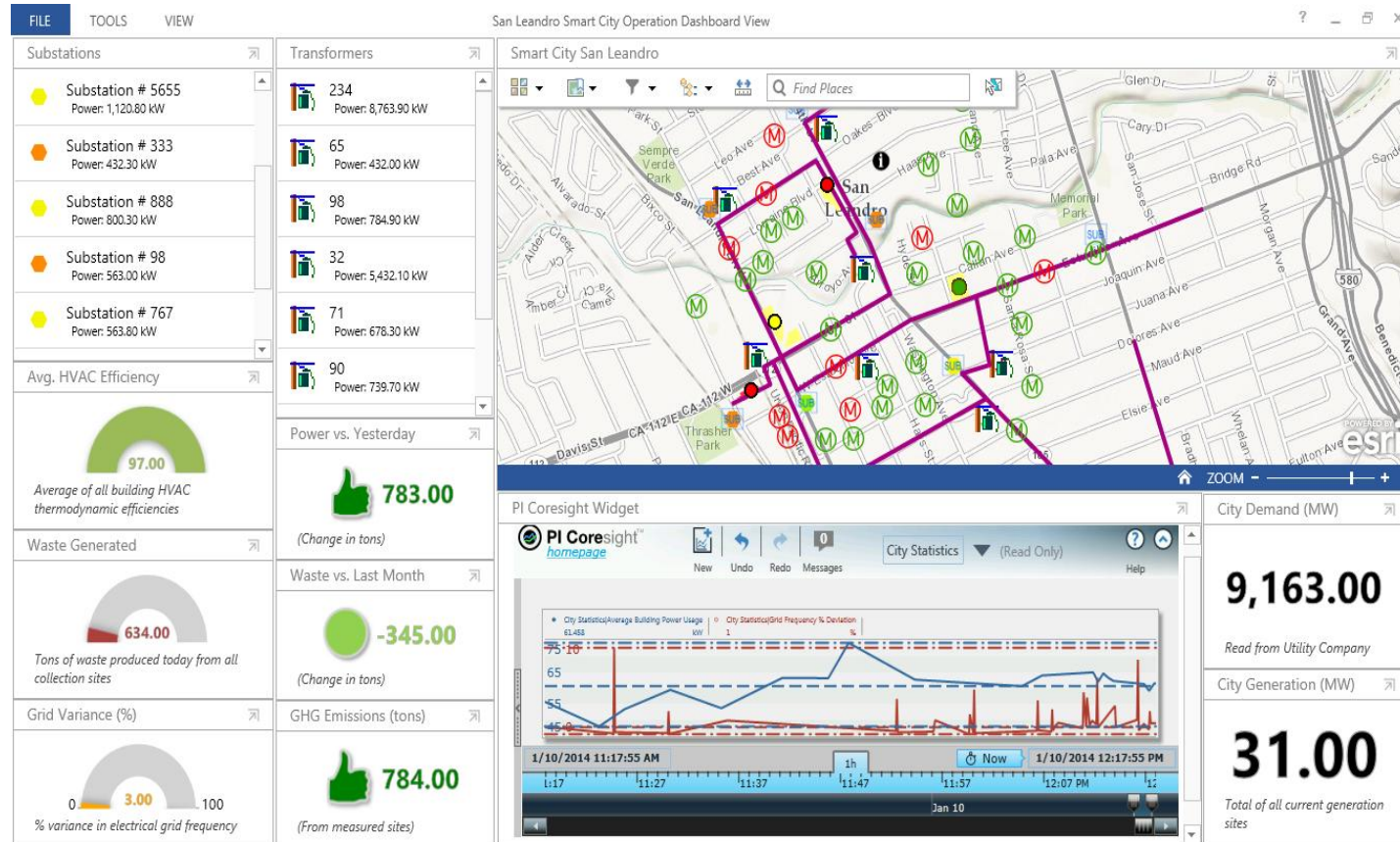
### Meters by Total Number of Jumps

- <= 1 Jumps (s)
- 1 - 5 Jumps
- 5 - 8 Jumps
- 8 - 11 Jumps
- >= 15 Jumps

- Collectors
- Pole Mount
- Pedestal Mount

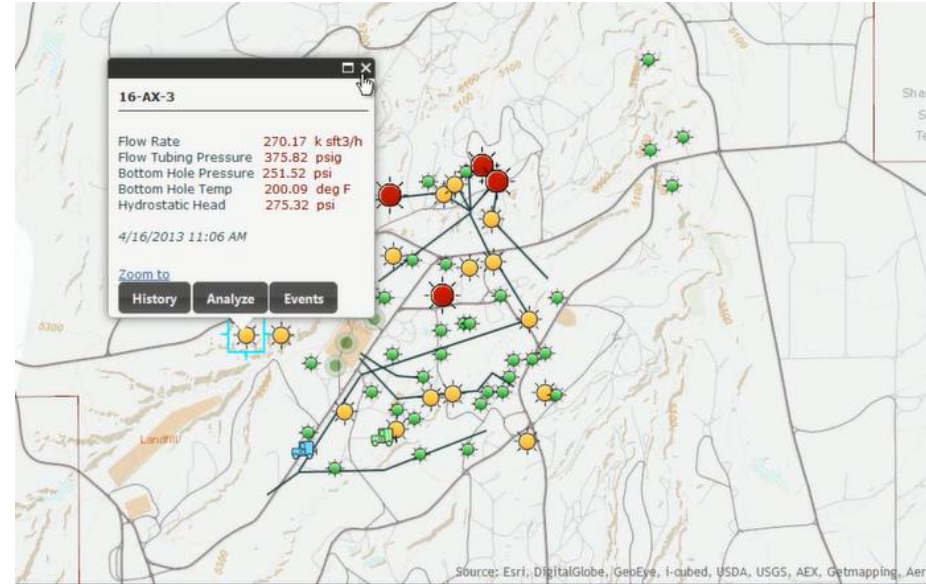
The 'blind' spot

# Operational Performance View

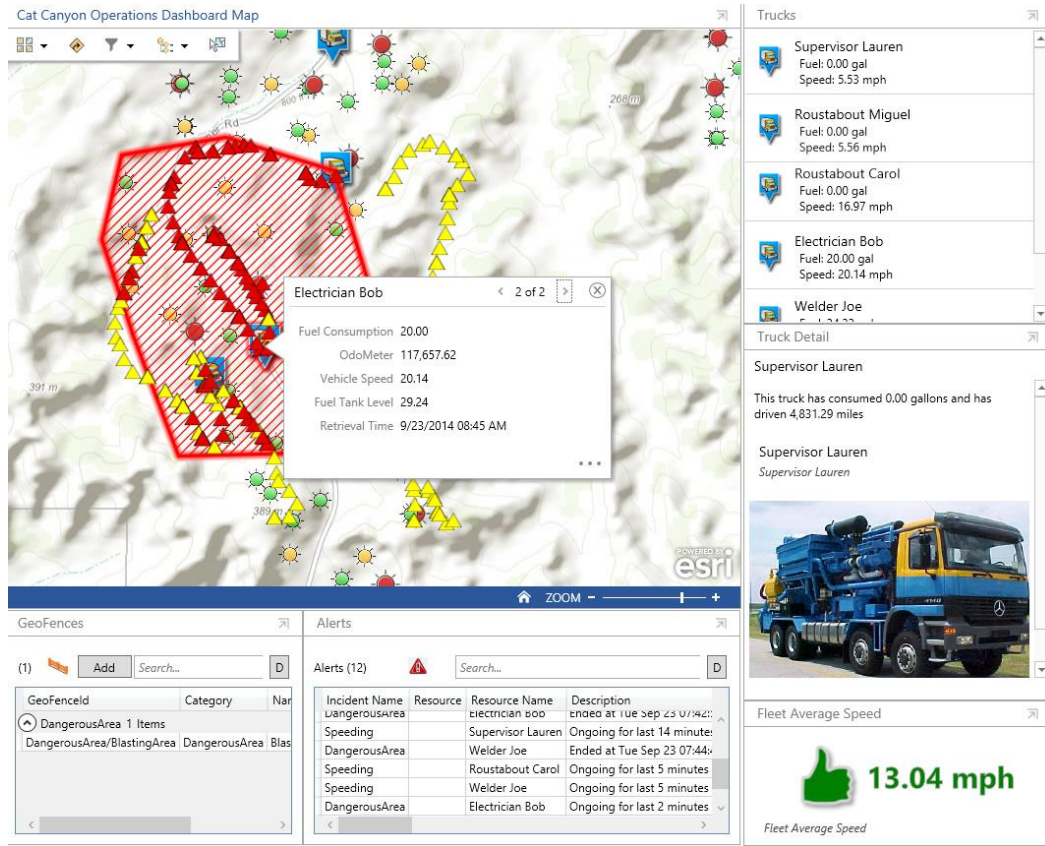


# Why are O&G Companies interested in PI Integrator?

- 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

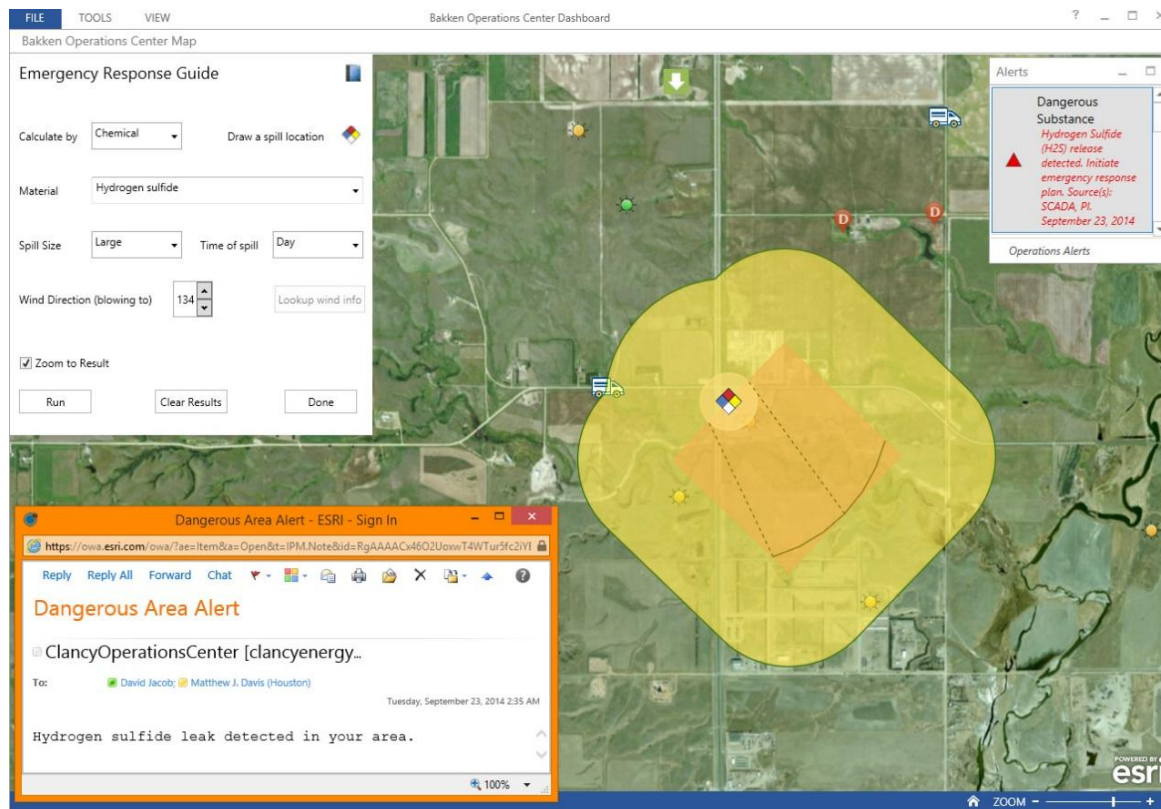


# Worker dispatch





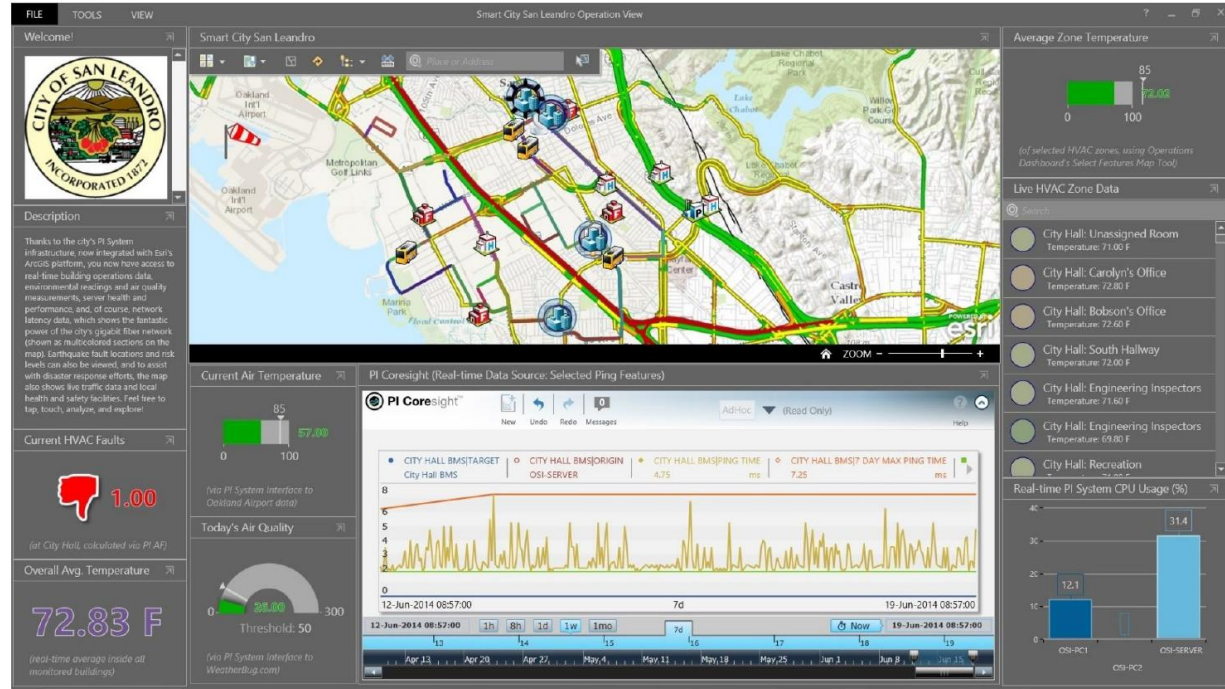
# Environmental Health & Safety



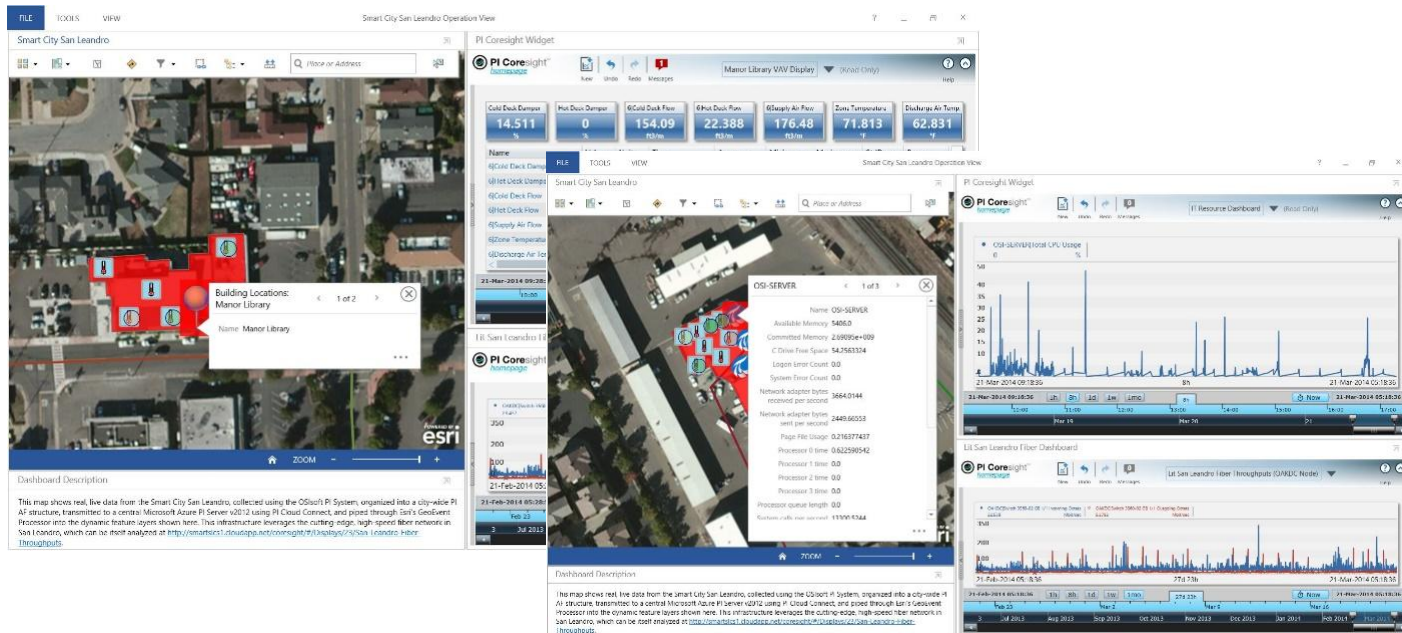


# What are Cities doing with PI System & ArcGIS

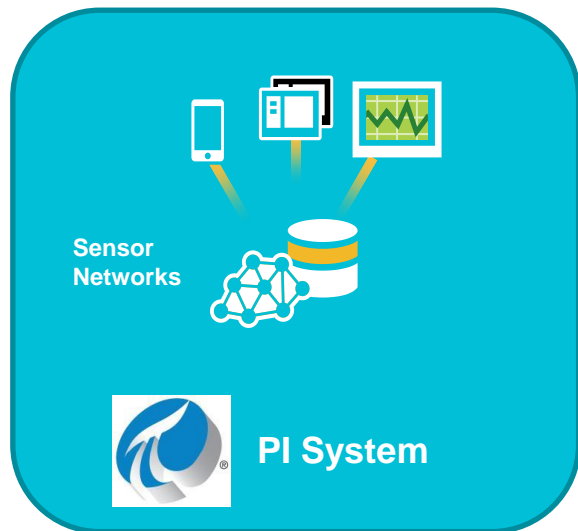
- Facilities
- Mobile Assets
- Utilities
  - Power
  - Water
  - Gas
- Environmental Monitoring
  - Air quality
  - Noise levels

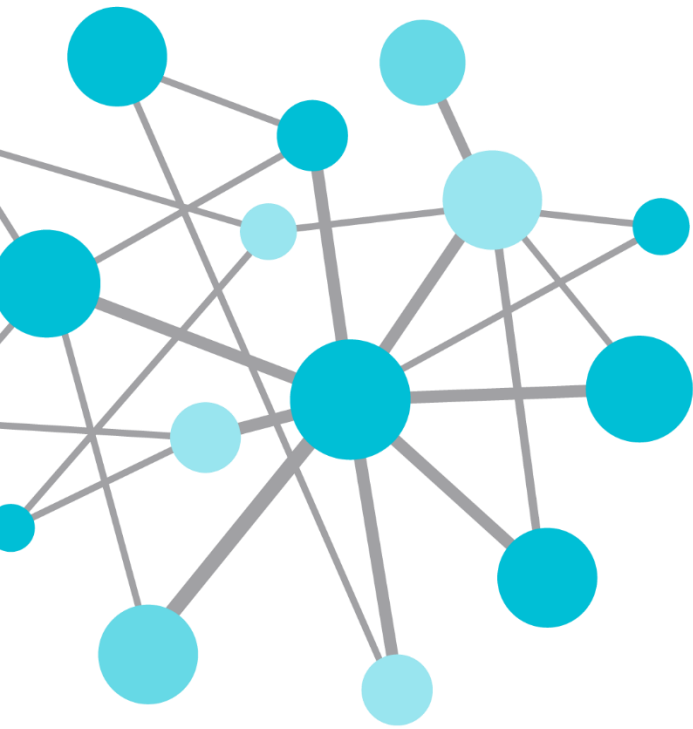


# Facilities & Energy Management



# Bringing Space and Time Together





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

Presented by **Anders Røpke**



# 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 2020<sup>1</sup>
- ROCE of 6-8% by 2016; 12-14% by 2020



## Strategic focus

### OFFSHORE WIND

DONG Energy capacity<sup>1</sup>  
GW



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



# 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

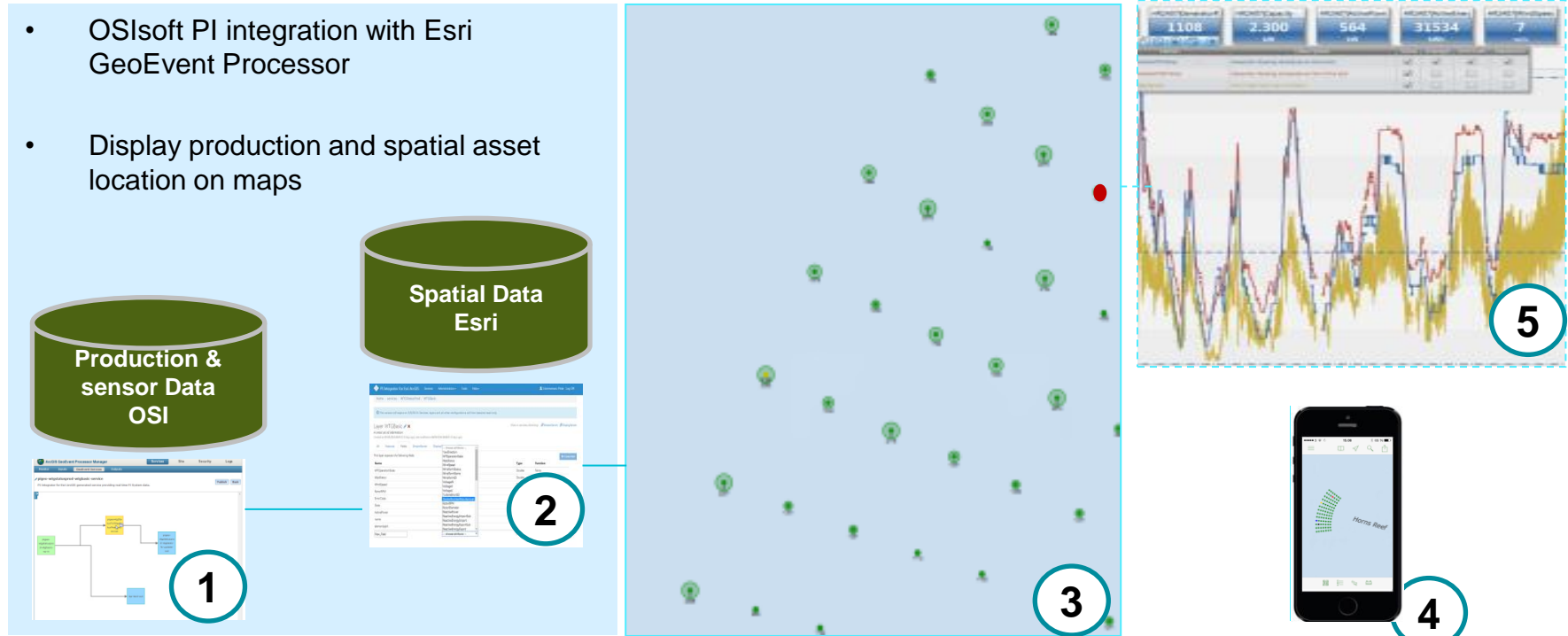
- Working offshore is one of the most dangerous workplaces in the world and any offshore organisation must have a strong focus on HSE
- Offshore activities are 15 times more costly than similar onshore activities and should be avoided if possible
- Lost production can be avoided by better logistical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



# 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)

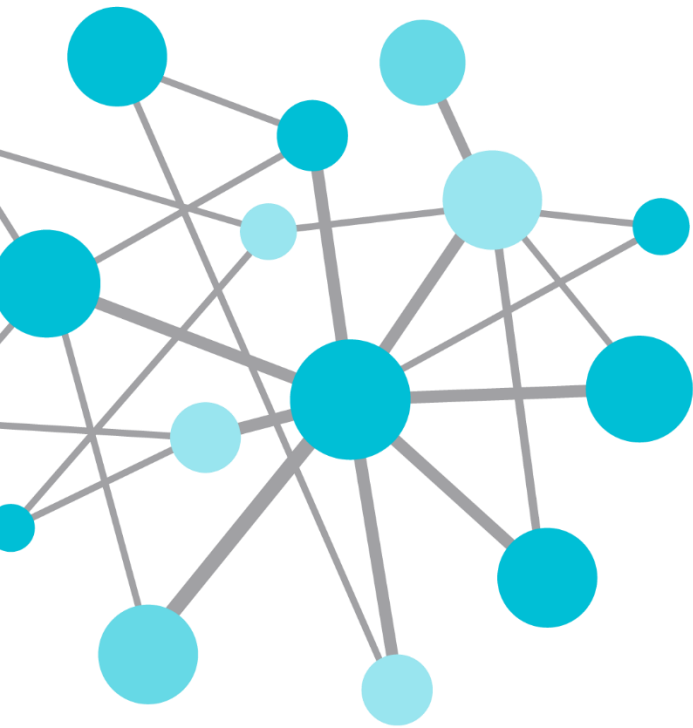
- Asset integrity improvements will reduce the total number of unscheduled visits to 1.800 offshore wind turbines in 2020
- Avoiding offshore maintenance visits due to better asset integrity and operational transparency will reduce HSE risk



# PI Integrator for Esri ArcGIS

1. 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. Greater agility to meet evolving business need





# Additional resources:

## YouTube Videos and Demos:

[http://youtu.be/yU4m\\_wg0TTU?list=PL40vX05wOAcCHPZpCMc-Diwn85L2ciz29](http://youtu.be/yU4m_wg0TTU?list=PL40vX05wOAcCHPZpCMc-Diwn85L2ciz29)

YouTube Training Videos (internal, 2.5 hours, start to finish installation, lots of technical details):

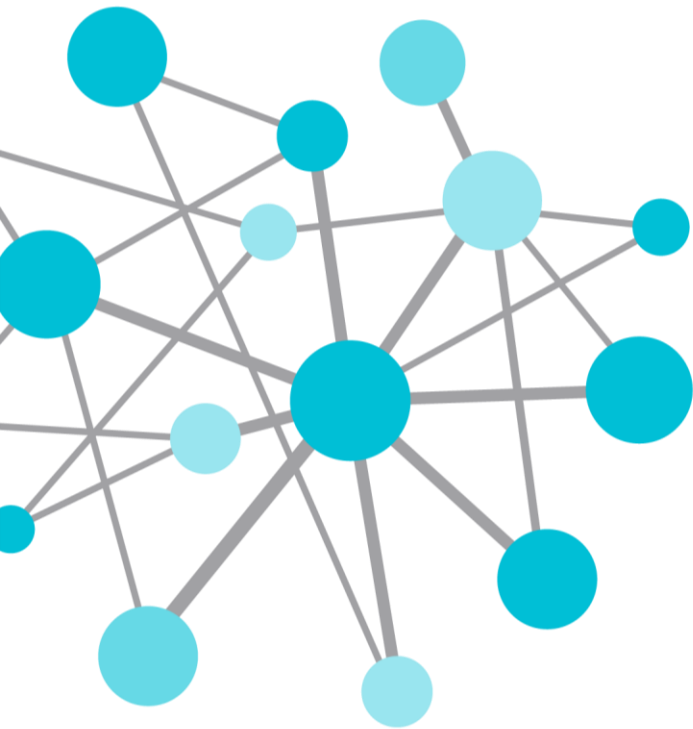
<https://www.youtube.com/watch?v=r25HLttOH4M&list=PLqT8Nmf2UoVPXfZz1xqoCC1YtYZbyjoJg>

# Stewart Young

[syoung@osisoft.com](mailto:syoung@osisoft.com)

Global Alliances Manager

OSIsoft, LLC



THANK  
YOU

Brought to you by  **OSI**soft.