

AVEVA PI WORLD

---

# Leveraging AVEVA PI Cloud Connect

Chevron Alen Offshore Facility

Nigeria/Mid-Africa Business Unit (NMA), Chevron's Middle East,  
Africa, South America Exploration & Production Company

Angela Taylor, Application Engineer

**AVEVA**



# Equatorial Guinea: Alen Platform + Bioko Gas Hub Operations Background



&



# Bioko Island Gas Hub

## Focusing on the Next Stage of Business

- Noble Energy EG has been in EG for over 20 years, starting with the Alba Field
  - Alba field is a large gas condensate that is produced to Bioko Island for processing
- Alen Platform Design is Unique:
  - One of the few platforms in the world that separates the condensate and the gas onsite
  - Condensate goes to the Aseng FPSO
  - Dry gas is reinjected for later use
- With declining production of developed natural gas and liquids from the Marathon Oil-operated Alba Field, more supply is needed.
- The vision for the Gas Mega Hub will be to process and liquefy gas from various proximate fields in EG and neighboring countries



### Alen Gas Monetization Project



Source: Noble Energy EG Ltd.

**The Opportunity:** As a part of Noble's Alen Offshore Facility, Noble Energy EG LTD, in Equatorial Guinea, Alen Field Gas Monetization project, a formal plan for shared information between the Noble Alen Field and the Marathon Alba Gas plant needed to be established that both companies could rely upon and met both companies' security measures.

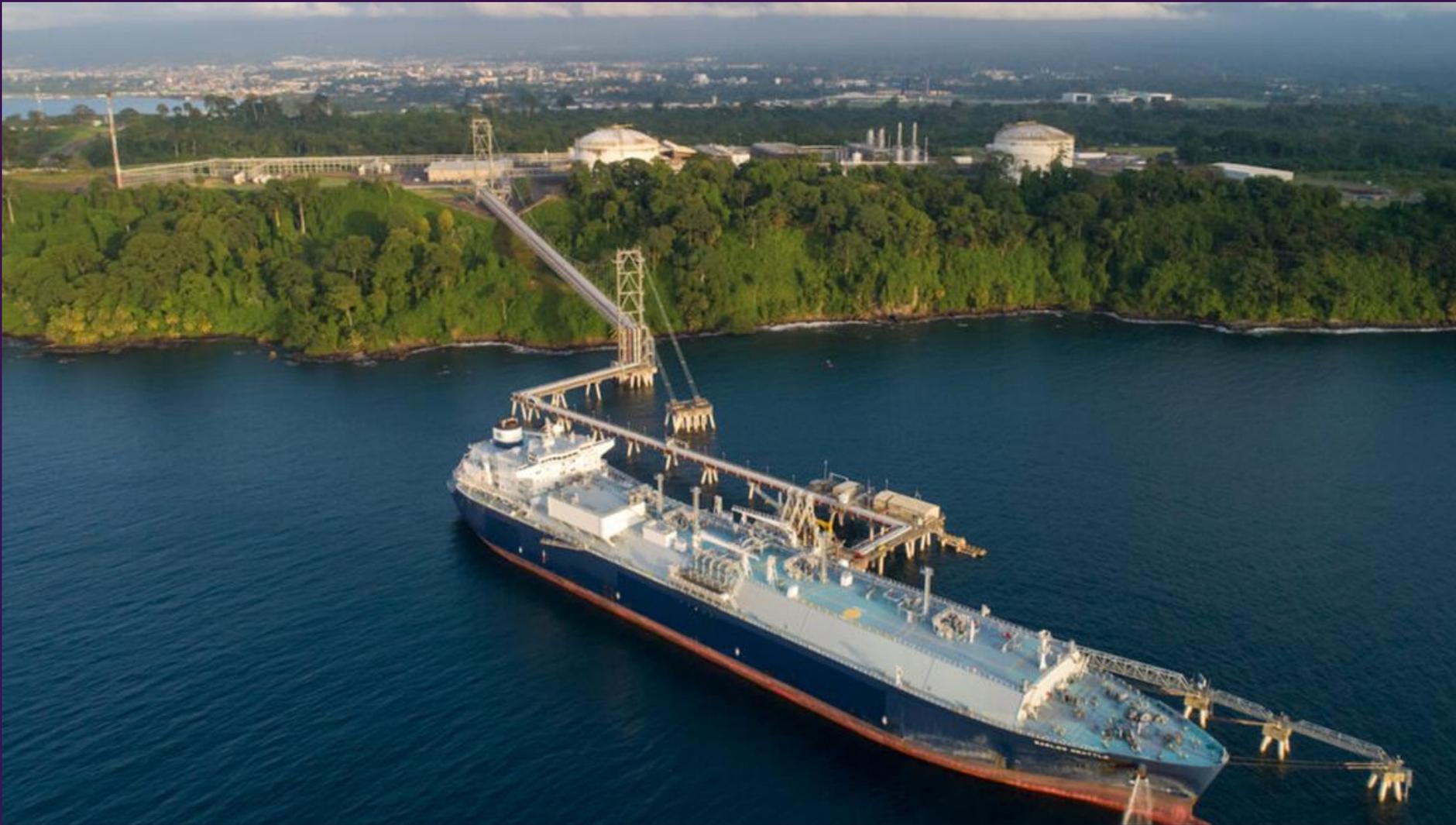
*Note: Alen Offshore Facility, Noble Energy EG LTD, a subsidiary of Noble Energy, Inc, is now Nigeria/Mid-Africa Business Unit (NMA), Chevron's Middle East, Africa, South America Exploration & Production Company.*

# Challenge:

## Safety in Sharing

- The Operating personnel from both groups agreed that sharing operating information would provide the safest and operationally beneficial arrangements.
- The information needed to be timely (close to if not real time) and provided in a form that can be used as an input into each other's monitoring systems.
- A PDF of a generated report or excel, even if received hourly would not provide the information needed.
- There needed to be a list of data points / tags that would be shared between the two companies to monitor pipeline shutdowns, pressures, temperatures, flowrates, nominations, notes and similar information.
- These inputs would not directly cause any actions on Alen or at Alba but will provide alerts and notifications to operations that actions should be considered.





FPSO =  
Floating  
Production  
Storage &  
Offloading

---

# Considerations:

## 3 options were presented to Leadership

1. Use a third-party company to exchange data, with each company burdened with additional expense.
2. Each company to create a business-to-business environment with a VPN IPsec tunnel to be created as the “bridge” between companies, with each company maintaining their infrastructure.
3. Leverage both company’s AF experience and utilize AVEVA’s PI Cloud Connect Service.



---

# PI Cloud Connect

A Secure + Performant Way to Exchange Data

## Security

- PI Cloud Connect utilizes four (4) layers of security:
  - **Infrastructure Level:** Data transfer is secured by SSL over HTTP (HTTPS) and through port 443 only
  - **Account Level:** Each company's account is fully isolated
  - **Sign-In Level:** Users authenticate at the PI Cloud Connect portal using a Microsoft account
  - **User Level:** Publishers control which users (not accounts) have subscription access

Microsoft  
Account



## Scalability + Performance

- Maximum data transfer throughput is up to 10k events/sec for 100K PI Tags per node
- High flexibility around size / scope of a publication data set
- No limits on the number of PI Connect nodes per account

## Ease of Deployment

- Customer (account) specific set up kit for the PI Connect nodes
- Initial connection to Azure is always outbound

---

# Selection

AVEVA PI Cloud Connect, software as a Service (SaaS) solution was chosen.



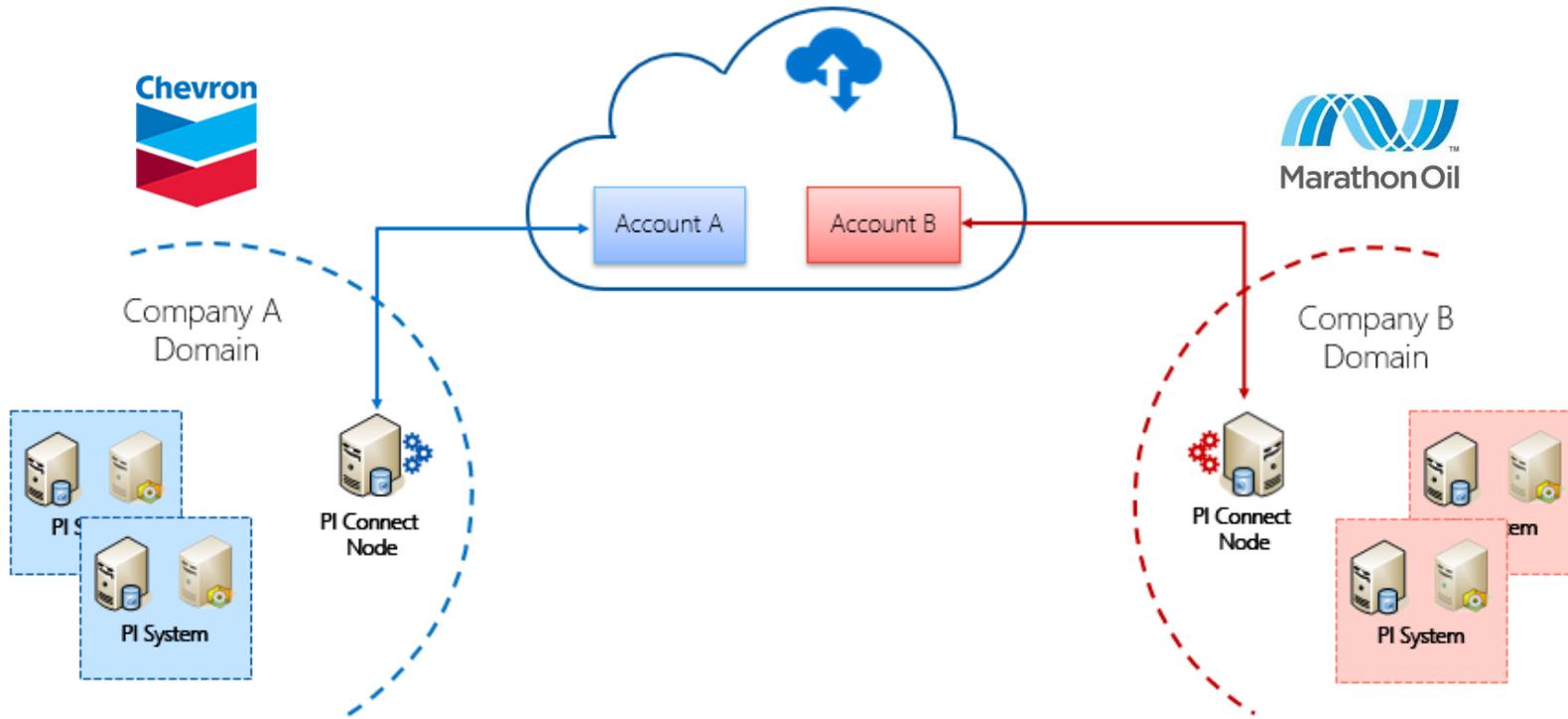
Why? PI Cloud Connect makes it easy to share data between PI Systems, both inside and outside the enterprise with a scalable and reliable solution based on Microsoft Azure with a minimal on-premises footprint.



The seamless and simultaneous transfer of time-series data between PI AF Structures was proven during the proof-of-concept phase and met our “close to if not real time” requirements.

# PI Cloud Connect Model Section

Connecting Operational Teams Together



---

# PI Cloud Connect Implementation

## Modeling Key Processes in Asset Framework

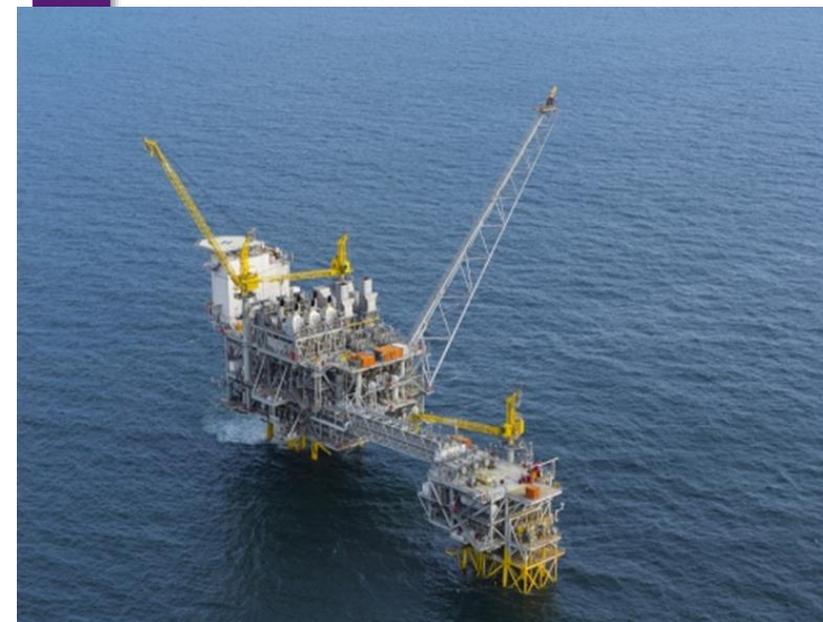
- Work began with each company implementing their own infrastructure and agreements with AVEVA, then decisioning of which points to share, agreed AF Structures for both Publishing and Subscribing. Data exchange began in December.
- PI Asset Framework enables you to create notifications for pressures, temperatures and valve changes and send alerts to operators and engineering staff; even build an escalation acknowledgement.
- Event Frames capture and classify key events. This allowed us to track and identify any repetition, allowing you to proactively understand and possibly eliminate such events.
- PI Asset Analytics logic allow managing by exception and complement our preventative maintenance schedules.
- PI clients (PI Vision / PI Datalink) provide visibility into meter imbalances for revenue and accounting.
- The PI System provides the ability to signal pipe through put and maximize production.



# Benefits and Value

## Working Together as One Team

- Faster Alen + Alba Plant Operator Collaboration + Response
- Safety Monitoring (Overpressure)
  - Critical for gas hub to safely manage multiple supplier headers
- Maximize Plant Throughput and Profit
  - Previously much gas was reinjected into the well, now more is sent directly for processing into methanol and LNG
- Asset Reliability (Corrosion Avoidance)
  - Monitor Gas/Liquids content + components
- Check-Meter Control Visibility + Reconciliation
- Avoid a third-party having direct access to our IT system



DZIĘKUJĘ CI  
 NGIYABONGA  
 TEŞEKKÜR EDERİM  
 DANKIE  
 TERIMA KASIH  
 СПАСИБО  
 GRAZIE  
 МАХАДСАНИД  
 GO RAIBH MAITH AGAT  
 БЛАГОДАРЯ  
 GRACIAS  
 ТИ БЛАГОДАРАМ  
 TAK DANKE  
 RAHMAT  
 HATUR NUHUN  
 PAKKA PÉR  
 HATUR NUHUN  
 PAKMAT CAĠA  
 CÁM ƠN BẠN  
 WAZVIITA  
 謝謝  
 TAPADH LEIBH  
 KEA LEBONHA  
 БАЯРЛАЛАА  
 MISAOTRA ANAO  
 WHAKAWHETAI KOE  
 DANKON TANK TAPADH LEAT  
 MATUR NUWUN  
 ХВАЛА ВАМ  
 MULŢUMESC  
 GRAZIE  
 고맙습니다  
 SHUKRA  
 HVALA  
 FAAFETAI  
 ESKERRIK ASKO  
 HVALA  
 TEŞEKKÜR EDERİM  
 OBRIGADO  
 MERCİ  
 DI OU MÈSI  
 ĎAKUJEM  
 GRAZZI  
 PAKKA PÉR  
 SIPAS JI WERE  
 TERIMA KASIH  
 UA TSAUG RAU KOJ  
 ТИ БЛАГОДАРАМ  
 СИПОС  
 KÖSZÖNÖM  
 GRACIES  
 SALAMAT  
 MAHADSANID  
 HVALA  
 MAHALO IĀ 'ŌE  
 TAKK SKALDU HA  
 ДЗЯКУЎ  
 FALEMINDERIT

# THANK YOU

This presentation may include predictions, estimates, intentions, beliefs and other statements that are or may be construed as being forward-looking. While these forward-looking statements represent our current judgment on what the future holds, they are subject to risks and uncertainties that could result in actual outcomes differing materially from those projected in these statements. No statement contained herein constitutes a commitment by AVEVA to perform any particular action or to deliver any particular product or product features. Readers are cautioned not to place undue reliance on these forward-looking statements, which reflect our opinions only as of the date of this presentation.

The Company shall not be obliged to disclose any revision to these forward-looking statements to reflect events or circumstances occurring after the date on which they are made or to reflect the occurrence of future events.

 [linkedin.com/company/aveva](https://www.linkedin.com/company/aveva)

 [@avevagroup](https://twitter.com/avevagroup)

#### ABOUT AVEVA

AVEVA, a global leader in industrial software, drives digital transformation for industrial organizations managing complex operational processes. Through Performance Intelligence, AVEVA connects the power of information and artificial intelligence (AI) with human insight, to enable faster and more precise decision making, helping industries to boost operational delivery and sustainability. Our cloud-enabled data platform, combined with software that spans design, engineering and operations, asset performance, monitoring and control solutions delivers proven business value and outcomes to over 20,000 customers worldwide, supported by the largest industrial software ecosystem, including 5,500 partners and 5,700 certified developers. AVEVA is headquartered in Cambridge, UK, with over 6,000 employees at 90 locations in more than 40 countries. For more details visit: [www.aveva.com](https://www.aveva.com)



**OPERATIONAL FACTS:**  
**Equatorial Guinea & Cameroon**

**Net Acreage (YE 2019)**

**316,000**

**Sales volumes (YE 2019)**

**44 MBoe/d  
(all in EG)**

**Total Proved Reserves (YE 2019)**

**132 MMboe**







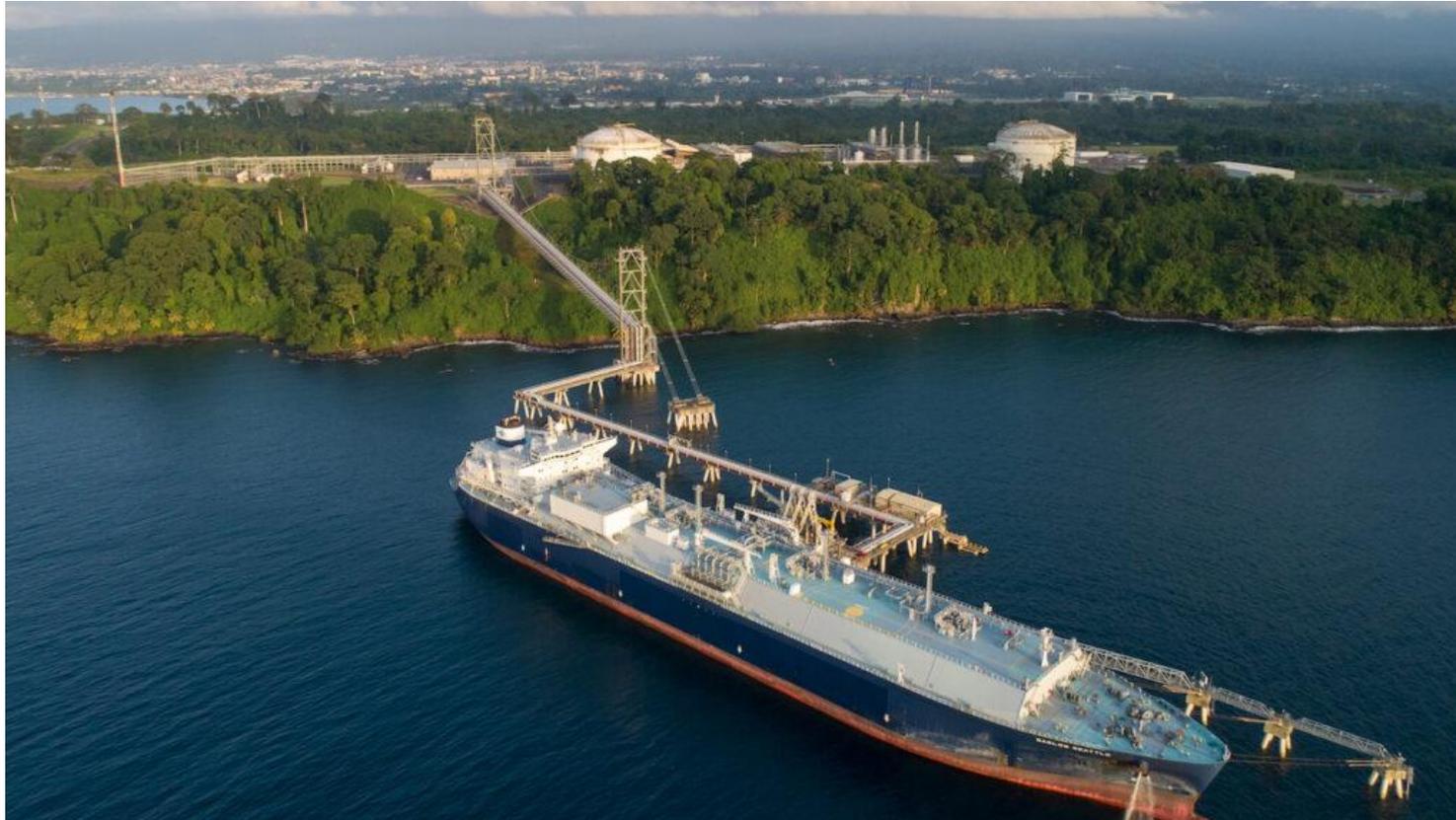




## Alen Gas Monetization Project



*Source: Noble Energy EG Ltd.*





## PI Cloud Connect

Alen Offshore Facility, Noble Energy EG LTD, a subsidiary of Noble Energy, Inc, is now Nigeria/Mid-Africa Business Unit (NMA), Chevron's Middle East, Africa, South America Exploration & Production Company.

# PI Cloud Connect

## Opportunity:

As a part of Noble's Alen Offshore Facility, Noble Energy EG LTD, in Equatorial Guinea, Alen Field Gas Monetization project, a formal plan for shared information between the Noble Alen Field and the Marathon Alba Gas plant needed to be established that both companies could rely upon and met both companies' security measures.

## Challenge:

The Operating personnel from both groups agreed that sharing operating information would provide the safest and operationally beneficial arrangements. The information needed to be timely (close to if not real time) and provided in a form that can be used as an input into each other's monitoring systems. A PDF of a generated report or excel, even if received hourly would not provide the information needed.

There needed to be a list of data points / tags that would be shared between the two companies to monitor pipeline shutdowns, pressures, temperatures, flowrates, nominations, notes and similar information. These inputs would not directly cause any actions on Alen or at Alba but will provide alarm and notifications to operations that actions should be considered.



# PI Cloud Connect

## Considerations:

Three (3) options were presented to Leadership. The first, use a third-party company to exchange data, with each company burdened with additional expense. The second, each company to create a business-to-business environment with a VPN IPsec tunnel to be created as the “bridge” between companies, with each company maintaining their infrastructure. The third, leverage both company’s AF experience and utilize OSIsoft’s PI Cloud Connect Service.

## Selection:

PI Cloud Connect, an OSIsoft Software as a Service (SaaS) solution was chosen. Why?, As stated on their website, makes it easy to share data between PI Systems, both inside and outside the enterprise with a scalable and reliable solution based on Microsoft Azure with a minimal on-prem footprint.

The seamless and simultaneous transfer of time-series data between PI AF Structures was proven during the proof-of-concept phase and met our “close to if not real time” requirements.



# PI Cloud Connect

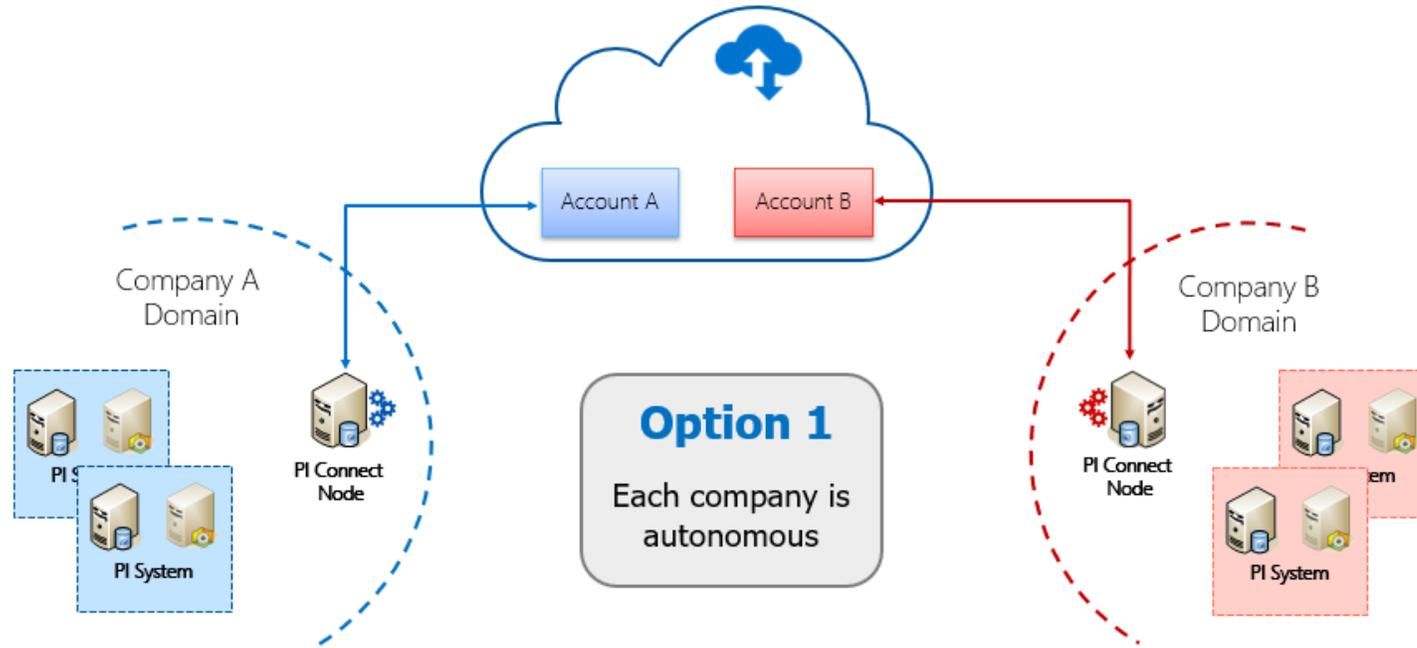
OSIsoft Cloud Services (OCS) is a database platform as a service (dbPaaS) designed for storing, retrieving, and analyzing real-time operations data. With OCS, people in and out of your organization have flexible and secure access operations data. OCS can collect operations data from within a primary control network to the edge of the industrial network. Use OCS to add context to time-based operations data, to enable process engineers and systems operators to make decisions and take corrective or preemptive actions. From data collection to data access to data delivery, OCS provides flexibility and control with its REST API.

## [OSIsoft Cloud Services](#)

Data sharing drives operations data science, application integration, and real-time collaboration. With OCS, the sky (well, cloud) is the limit.



# PI Cloud Connect Model Section



# PI Cloud Connect Customer Portal

## <https://www.picloudservices.com/Login>

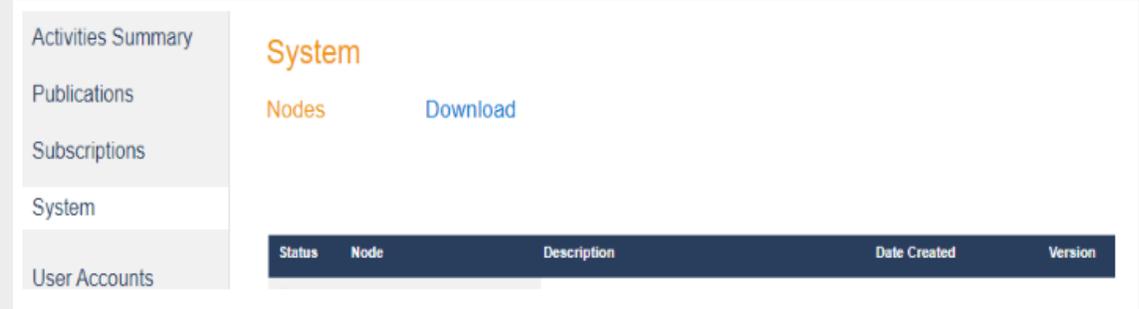
Recommended items to create/decide before beginning set-up:

- a) Complete your activation.
- b) Company alias: to define your company's publication to others (Example: 123Energy).
- c) An Azure AD or Microsoft Account (AAD, MSA) (to be used when authenticating to an OSIsoft Cloud Tenant) for "User Account". (Example: User@outlook.com)
- d) Service Account
- e) Email address(s) for Subscribers of your Publication

The screenshot shows the PI Cloud Connect Customer Portal interface. At the top, there is a dark blue header with the PI Cloud Connect logo on the left and the user name 'Laurent Outlook | Petrolux (petrolux) | Sign out' on the right. Below the header is a navigation menu on the left with the following items: Activities Summary (highlighted), Publications, Subscriptions, System, User Accounts, Bulletins, and Feedback. The main content area is titled 'Activities Summary' and contains four colored cards: 'Publications' (blue) with '1 running' and the description 'Share your real-time data, AF assets and more'; 'Subscriptions' (blue) with '2 running' and the description 'Consume data shared by other users'; 'User Accounts' (orange) with '4 total' and the description 'Add or edit user accounts'; and 'System' (green) with '1 total' and the description 'Configure and view nodes'. At the bottom of the page, there is a dark blue footer with 'Cookie Consent' and a 'Help' link.

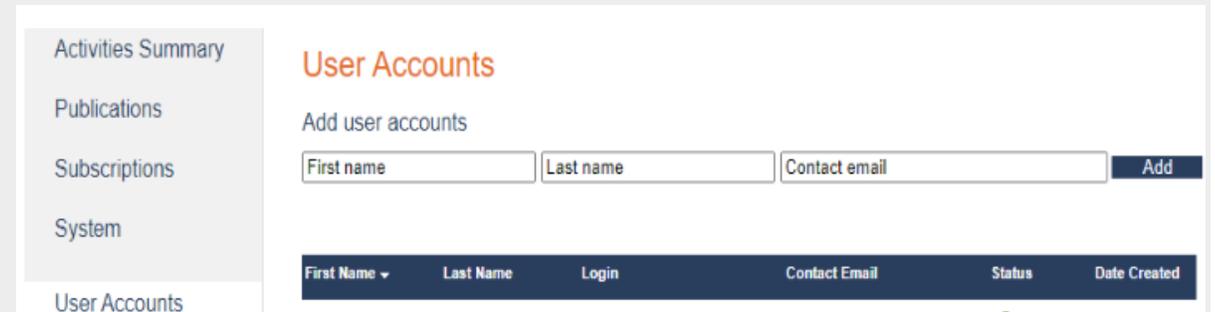
# System Accounts and User Accounts

- System is the Node or PI Interface Server



The screenshot shows a web portal interface. On the left is a navigation menu with items: Activities Summary, Publications, Subscriptions, System (highlighted), and User Accounts. The main content area is titled "System" and includes a "Nodes" link and a "Download" button. Below this is a table with the following headers: Status, Node, Description, Date Created, and Version.

- User Account is your [User@outlook.com](mailto:User@outlook.com) account.
  - Users have the permissions to manage the portal.



The screenshot shows a web portal interface for user management. On the left is a navigation menu with items: Activities Summary, Publications, Subscriptions, System, and User Accounts (highlighted). The main content area is titled "User Accounts" and includes a section "Add user accounts" with three input fields: "First name", "Last name", and "Contact email", followed by an "Add" button. Below this is a table with the following headers: First Name, Last Name, Login, Contact Email, Status, and Date Created.

# Create a Publication

Once you have defined the AF Structure with Elements, Attributes and the configuration items to share, you are ready to create a Publication.

Remember, the entirety of the AF structure will be published.

Recommendation:

Use a Separate AF Server for Publishing and Subscribing or at the very least Create a separate database for this purpose.

Activities Summary | **Publications** | + Create Publication

Publications

- Define your Source

Create Publication

● Data Source ● Publication Scope ● Publishing Options ● Publication Name

Choose the source for the data in your publication

Namespace	Node ▾	Node User Account
PI AF Server Name_Publication (DB Name)	PI Interface Server	Service Account

# Create a Publication

- Select your AF Elements

- Once AF Elements are selected, your next option is to start the Publication.
  - Start 0 Minutes of history, this point forward.
  - If you want to allow data from a point back in time, you can define it here.

Specify a start time for your data. Value for any selected units must be between 0-30

0 Minutes of history

Summary

PI Cloud Connect

Laurent Outlook | Petrolux (petrolux) | Sign out

Create Publication

Data Source Publication Scope Publishing Options Publication Name

Select the type of the AF assets you wish to publish:

Browse your AF asset hierarchy to select the AF element that you want to publish

Data Archive

- ▲ Pump Station
  - Pump01
  - Pump02
  - Pump03
  - Pump04
  - Pump05
  - Pump06

**Summary**

**Node:**  
CALVIN7910

**Data source:**  
CALVIN7910.Pumps CBM Demo

**AF element to publish:**  
Not specified

Cookie Consent [Help](#)

# Create a Publication

- Last, Invite your Subscriber(s)

PI Cloud Connect Laurent Outlook | *Petrolux (petrolux)* | Sign out

Publication Details: **OSIsoft Pumps Demo**

**Created By** Petrolux

**Description**

**Publication Type** Element Publication

**Date Created** 26 Nov 19

**Node** ✔ CALVIN7910

**Data Source** \\CALVIN7910\Pumps CBM Demo\Pump Station

**Status** ✔ Sending [Stop Publishing](#)

**Data Delay** No Delay

**Subscribers (2/2)**  
[Invite Subscribers](#)

Invitation	Configured	Account	Status	Receiving Progress
jparker@geocgi.com	Yes	Geospatial Consulting Group Intl	<span style="color: orange;">!</span> Stopped	40% <input type="text"/>
lgarrigues@outlook.com	Yes	Petrolux	<span style="color: green;">✔</span> Started	100% <input type="text"/>

Page 1 of 1 View 1 - 2 of 2

✕ ✔

Cookie Consent [? Help](#)



# Create a Publication

- Publication is complete

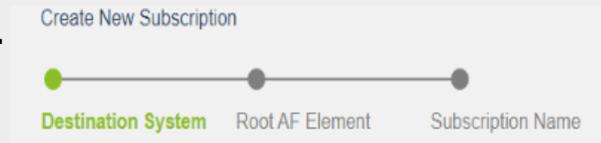
The screenshot displays the 'PI Cloud Connect' user interface. At the top, the user is identified as 'Laurent Outlook | Petrolux (petrolux) | Sign out'. The left sidebar contains navigation options: 'Activities Summary', 'Publications', 'Subscriptions', 'System', 'User Accounts', 'Bulletins', and 'Feedback'. The main content area is titled 'Publications' and includes a '+ Create Publication' button. Below this, there are action buttons: 'Stop Publishing', 'View Details/Manage Subscribers', 'Subscribe', and 'Delete'. A table lists the publications:

Status	Publication Name	Created By	Date Created
✓ Sending	OSisoft Pumps Demo	Petrolux	26 Nov 19

At the bottom of the interface, there are links for 'Cookie Consent' and 'Help'.

# Create a Subscription

- To Subscribe to a Publication, you choose Publications.
- Click on the Publication you want to subscribe to, then click Subscribe.
- Choose the AF Server and Database.  
(Create this before Subscribing)
- You can Pre-fix the tags that will be created on your PI Archive.



Choose the destination system for the data in your subscription

Namespace	Node	Node User Account
PI AF Server Name / Database	PI Interface	Service Account

PI Cloud Connect    Laurent Outlook | PetroLux (petrolux) | Sign out

Publications    + Create Publication

Stop Publishing    View Details/Manage Subscribers    Subscribe    Delete

Status	Publication Name	Created By	Date Created
✓ Sending	OSisoft Pumps Demo	PetroLux	26 Nov 19

Cookie Consent    Help



# Create a Subscription

- Subscription is complete.

The screenshot displays the 'PI Cloud Connect' interface. At the top, the header includes the logo and the text 'PI Cloud Connect', along with the user name 'Laurent Outlook | Petrolux (petrolux)' and a 'Sign out' link. A left-hand navigation menu contains the following items: 'Activities Summary', 'Publications', 'Subscriptions' (which is highlighted), 'System', 'User Accounts', 'Bulletins', and 'Feedback'. The main content area is titled 'Subscriptions' and features a table with the following data:

Status	Subscription Name	Source Publication	Date Created	Receiving Progress
✓ Receiving	Self Subscribe to Pumps CBM Demo	✓ OSisoft Pumps Demo	4 Feb 20	100%
✓ Receiving	SLTC Energy test	✓ SLTC Energy - OAK	17 Jun 21	99%

At the bottom of the interface, there is a 'Cookie Consent' button and a 'Help' link with a question mark icon.



# References

- <https://docs.osisoft.com>
- [OSIsoft Cloud Services](#)
- [Onboarding \(osisoft.com\)](#)
- [Playbook – PI Cloud Connect \(osisoft.com\)](#)



# Questions





# AVEVA PI World

DIGITAL

AVEVA PI World 2021 is the premier online experience for AVEVA & OSIsoft customers, partners, developers, and innovators using data and analytics to transform our world.

Take your skills and experience to the next level with expanded learning, exclusive speaker opportunities, and recognition of your expertise!

Submit your story idea using [Call for Papers](#)

# Share your story!

## Benefits of speaking

- Recognition of your expertise as a leader and the success of your team and organization
- Showcase your knowledge with peers in your industry and beyond
- Promote your organization's success and be recognized as a leader
- Exclusive speaker opportunities (including special events with industry experts)
- Build your speaking skills with expert training and close support from our events team
- Plus, a gift of our appreciation!



# Where does your story fit?

How have AVEVA products and/or the PI System improved your company, workforce, products, and community?



**Industry:** Focus on implementation and specific use cases in your industry



**Analytics:** Share your work in AI, data science, and industrial analytics projects



**Engineering & Operations** – Demonstrate how you've utilized data across enterprise and employed the AVEVA portfolio & PI System alongside other technology.



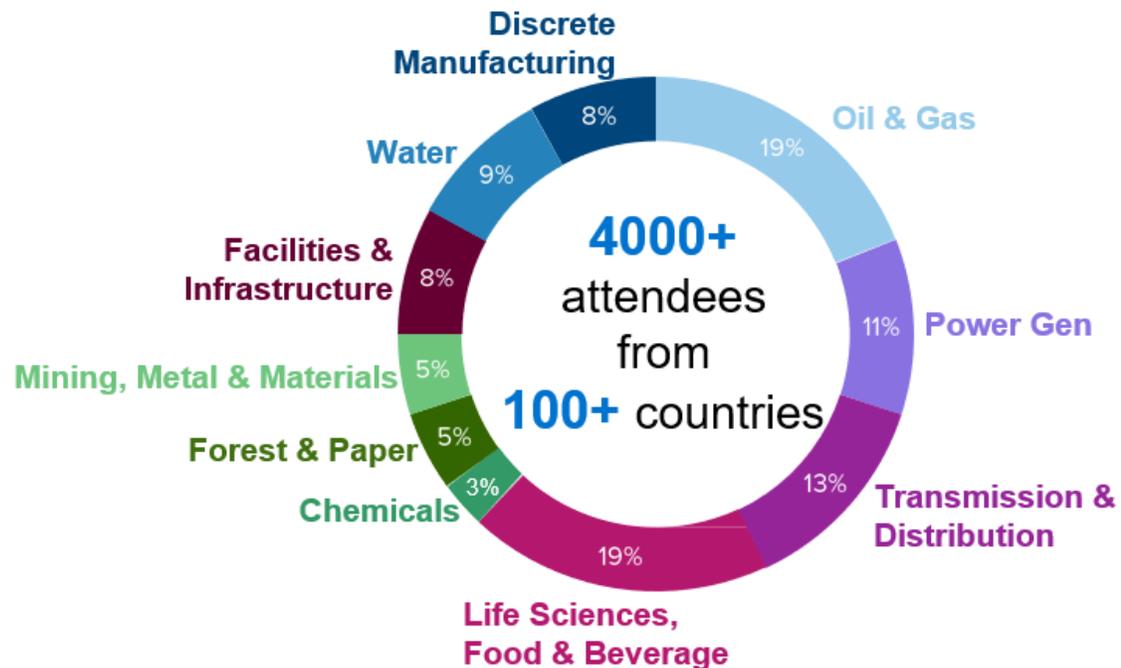
**Development** – Breakdown silos in operation and teams. Show innovative use of technologies, Digital Twin, Cloud, or integration of IoT in your business.



**Product** – Showcase use of products within or across our portfolio

# AVEVA PI World 2021 combines PI World & AVEVA World Conference

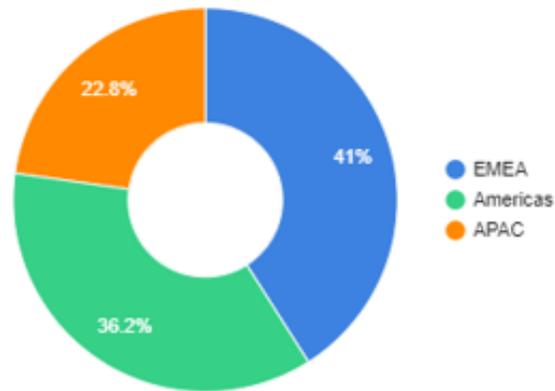
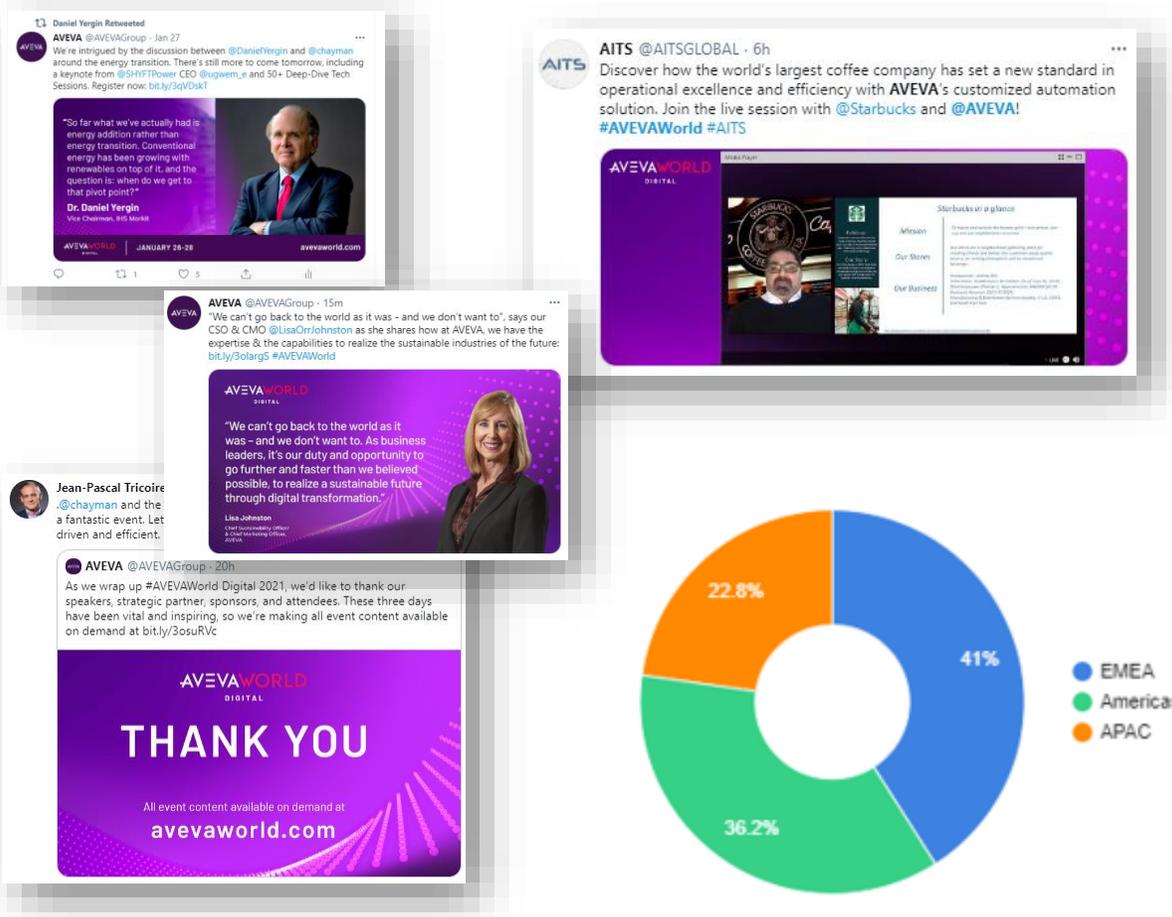
PI World Online 2020 drew over 4,200 engaged participants worldwide



- **1,300 companies** from a diverse set of industries
- Engaged participants watched an average of **87 minutes** of content
- Participants included: customers, developers, executives, innovators and more!

# AVEVA PI World 2021 combines PI World & AVEVA World Conference audiences

AVEVA World 3 Digital drew 3,850 attendees



- Over **7,200 registrants**
- Viewership totaled a combined **10,250 hours**; average viewer watched more than **85 minutes** of content
- **7.7 million social media impressions**
- Global audience including partners, customers, prospects, and analysts
- Over **2300 visits** to expo booths

*“Encourage your users to attend PI World; they will find a tool you did not know they needed. That is the way to get adoption.”*

Chairperson, Life Sciences User Group

*“Identify new ways to use the system and meet peers in the industry as well as face to face contact with staff. Excellent conference!”*

Director, Power & Utilities agency

*“Great opportunity to get your questions answered, take advantage of learning labs, and make new friends all in one setting.”*

DCS Administrator, Chemicals producer

A promotional banner for AVEVA API World Digital. The background is a deep purple with abstract, glowing white and yellow wave-like patterns on the left side. On the right, a woman with dark hair pulled back, wearing a white lace-up blouse and dark trousers, stands at a podium with a microphone, smiling. The text is centered in white and yellow.

AVEVA API World

DIGITAL

OCTOBER 19-21, 2021

Share your story

Visit [Call for Papers](https://piworldcfp-us2021.hubb.me)

<https://piworldcfp-us2021.hubb.me>