

AVEVA PI WORLD

VELCO Community Agreement

VELCO's Journey with PI

Presented by:

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About our company ...

VELCO VERMONT'S TRANSMISSION RELIABILITY RESOURCE

MOVING POWER. MOVING FORWARD™



Vermont Electric Power Co., Inc. (VELCO)

PI Community Agreement

- Transmission only utility – 1956, first in the nation
- Manages 730 Miles of transmission lines, 1,500 miles of fiber optic cable, 65 transmission facilities and 55 radio sites
- Owned by Vermont's 17 distribution utilities



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High-level results obtained & business impact

VELCO PI Community Agreement



Challenge

Providing state-of-the-art real-time monitoring and analytics capabilities for all our utility owners and for our internal customers in our operations, planning, engineering, telecom and IT departments.

Solution

Deployed PI Community Agreement by building an external facing private cloud with permission based access via Azure to provide PI Vision access as an advanced foundation for Process Monitoring, Condition Based Maintenance & Advanced Analytics

Benefits

Allows VELCO to provide a higher level of service and support to our utility owners by providing systems that allow for the sharing and management of asset data and information.

“Even if you are on the right track, you’ll get run over if you just sit there.”

– Will Rodgers



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Business challenges addressed ...

Challenges! Keep **moving**, down the right track!

PI Community Agreement demonstrates how **technology provides business value**

- Providing our utility owners with access to PI where they can securely archive and monitor their systems.
- Promoting informed decision making across the organization
 - How high is system state load today compared to available generation?
- Continuous improvement for asset management
 - How can we share data throughout our company and provide data visualization and analytics to improve asset management?
- From VELCO Challenge Board

“Regulatory and business requirements have been driving VELCO to strengthen and expand its data storage and analytics capabilities”



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Use cases and applications ...

AVEVA Systems = Foundation of Digital Transformation!

PI Community Agreement delivers!

- Real time monitoring and notifications for generator fuel levels and burn rates at radio sites



Radio Site Index and Links



■ SiteBoss Operating Normally
 ■ SiteBoss Not Communicating
 ● Generator Not Running
 ● Generator Running
 , Or Bad Data

 Full
 Safe
 Low
 Very Low

Note: For Propane Tanks, 80% Is Full

Use cases and applications...

AVEVA Systems = Foundation of Digital Transformation!

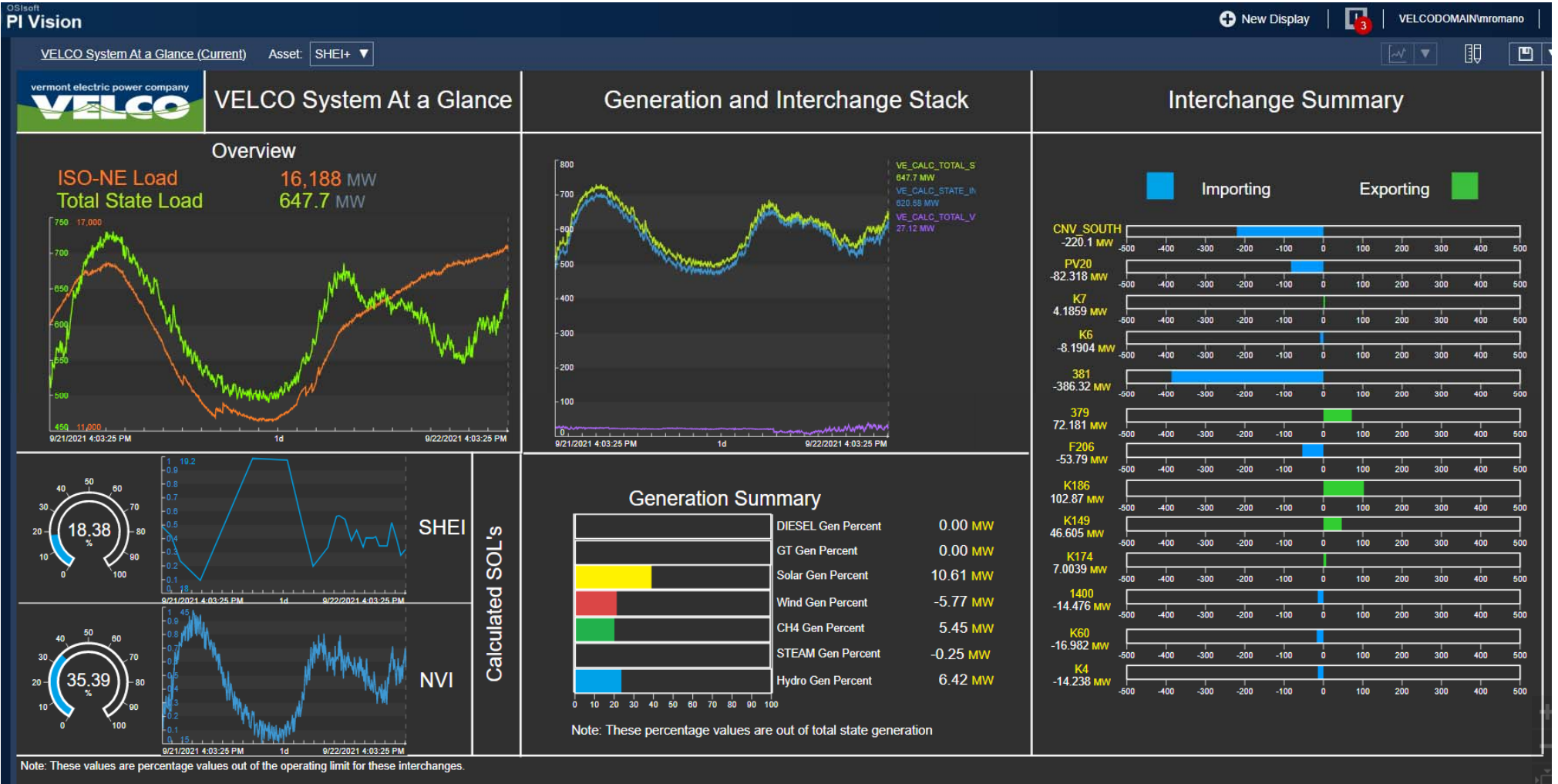
PI Community Agreement delivers!

- “System At A Glance” PI Vision dashboard for electric system operations



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“If I had asked people what they wanted, they would have said faster horses”
-- Henry Ford



"Technology is best when it brings people together."

Matt Mullenweg, CEO Automatic

Implementation details ...

PI Community Agreement - Implementation

Implementation through collaboration and innovation!

Washington Electric Coop (WEC)

Stowe Electric Department

Lyndonville Electric Department

Vidya Shettar – Customer Success Manager, AVEVA

Dan McGovern – Systems Engineer, Success Services, AVEVA

DLL Solutions – Jeremy Mahon, Gerry Crispin, Kapil Rakh



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Implementation details ...

PI Community Agreement - Implementation

Implementation through collaboration and innovation!

- Implementation Results
 - Delivered PI Vision access to our utility owners
 - Connected distribution utility feeders to VELCO fiber network to transfer SCADA data to PI
 - Reduced strain on EMS systems by moving non-critical SCADA data off critical information systems to PI and PI Vision
 - Dynamic application of PI Vision for monitoring and managing the VELCO HQ solar arrays



"Data is the new oil? No, data is the new soil."

– David McCandless, Information Designer

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Pinnacle Solar

Solar RTAC Comms: ● Normal 9/16/2021 6:02:28 AM
BESS RTAC Comms: ● Normal 9/16/2021 6:02:28 AM

Solar DNP Interface: 0 | Good [To System \(Up\)](#)
[Control HMI](#)

Solar Total Meter

645,630 KWH
0.44 KW PF: 0.070
2.66 KVAR 59.975 HZ
281.91 VOLTS 3 A
283.05 VOLTS 2 A
284.95 VOLTS 3 A

BESS Total Meter

-31,925 KWH -31,925 KWH
-4.04 KW PF: 0.351
-1.02 KVAR 59.975 HZ
282.01 VOLTS 13.858 A
283.05 VOLTS 13.929 A
284.97 VOLTS 11.929 A

BESS
Aux Load:
3.23 KW
18,566 KWH
210.3 VOLTS
9.9 A

Met Data

POA Irrad.: 0.6 W/m2
Ambient Temp: 57.3 DEGF
Module Temp: 52.8 DEGF
Wind Speed: 0.8 MPH
Direction: 308.6 DEG

BESS Telemetry

Inv: 0.9 KW -1 KVAR
Inv-DC: 1,136 VOLTS
Battery: 1,129 V 82.6 %charge
Top/Mid/Bot: 72.8 / 69.5 / 71.9 °F
Enclosure: 67.43 %relative humidity
DCA: 68.5 °F

Status /
Alarm

Solar Inverter Status

	Power	Status	Fault Codes			
			#0	#1	#2	#3
● Inv #1	0.0 KW	8,192	0	0	0	0
● Inv #2	0.0 KW	8,192	0	0	0	0
● Inv #3	0.0 KW	8,192	0	0	0	0
● Inv #4	0.0 KW	8,192	0	0	0	0
● Inv #5	0.0 KW	8,192	0	0	0	0
● Inv #6	0.0 KW	8,192	0	0	0	0
● Inv #7	0.0 KW	8,192	0	0	0	0
● Inv #8	0.0 KW	8,192	0	0	0	0
● Inv #9	0.0 KW	8,192	0	0	0	0
● Inv #10	0.2 KW	8,192	0	0	0	0

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How AVEVA product capabilities solved our business challenges ...

AVEVA products installed and used for the PI Community



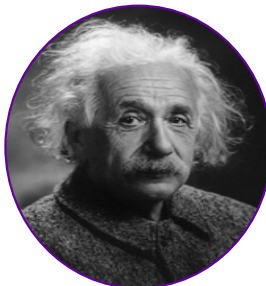
PI Interfaces

- SNMP
- RDBMS
- PitoPI
- DNP3
- UFL



PI DA

- Storage of twenty years of transmission system SCADA data



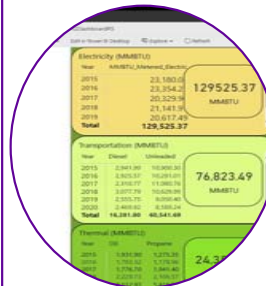
PI AF

- Analytics and notifications



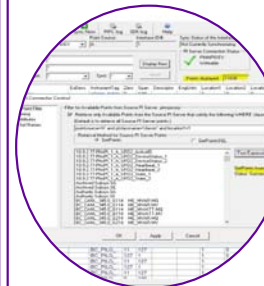
PI Vision

- Increasing the visibility of operations and eliminating single points of failure



PI Integrator for BA

- Working to enable data sharing for our utility owners



PI APS

- Allows us to keep three separate PI domains synchronized



Impact, Savings \$, work time saved, quality improvement, increased understanding of the process ...

Benefits – Improvements – Savings!

PI Community Agreement – Benefits to VELCO and our DU owners

- Moving from literally counting tags to an unlimited tag use
- Extending the PI use from the EMS SCADA operations area to the whole organization – power planning, engineering, telecom.
- Providing savings and operational support to our utility owners
- Acquired a deeper understanding of the daily challenges encountered by our customers



What we learned, accomplished, and where we need to go ...

Conclusions

PI Community Agreement – Summary and Conclusion

- What did we learn?
 - How to leverage technology to transform data into actionable information.
- What did we accomplish?
 - We built an up-to-date and secure PI environment poised for unlimited data acquisition.
- Where are we going?
 - Working towards a CIM to expand data possibilities across the environment including our owner customers.

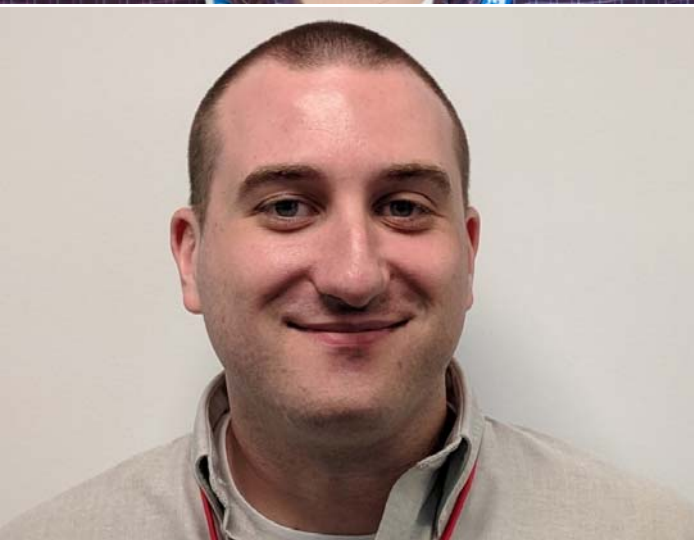




Jarrod Harper

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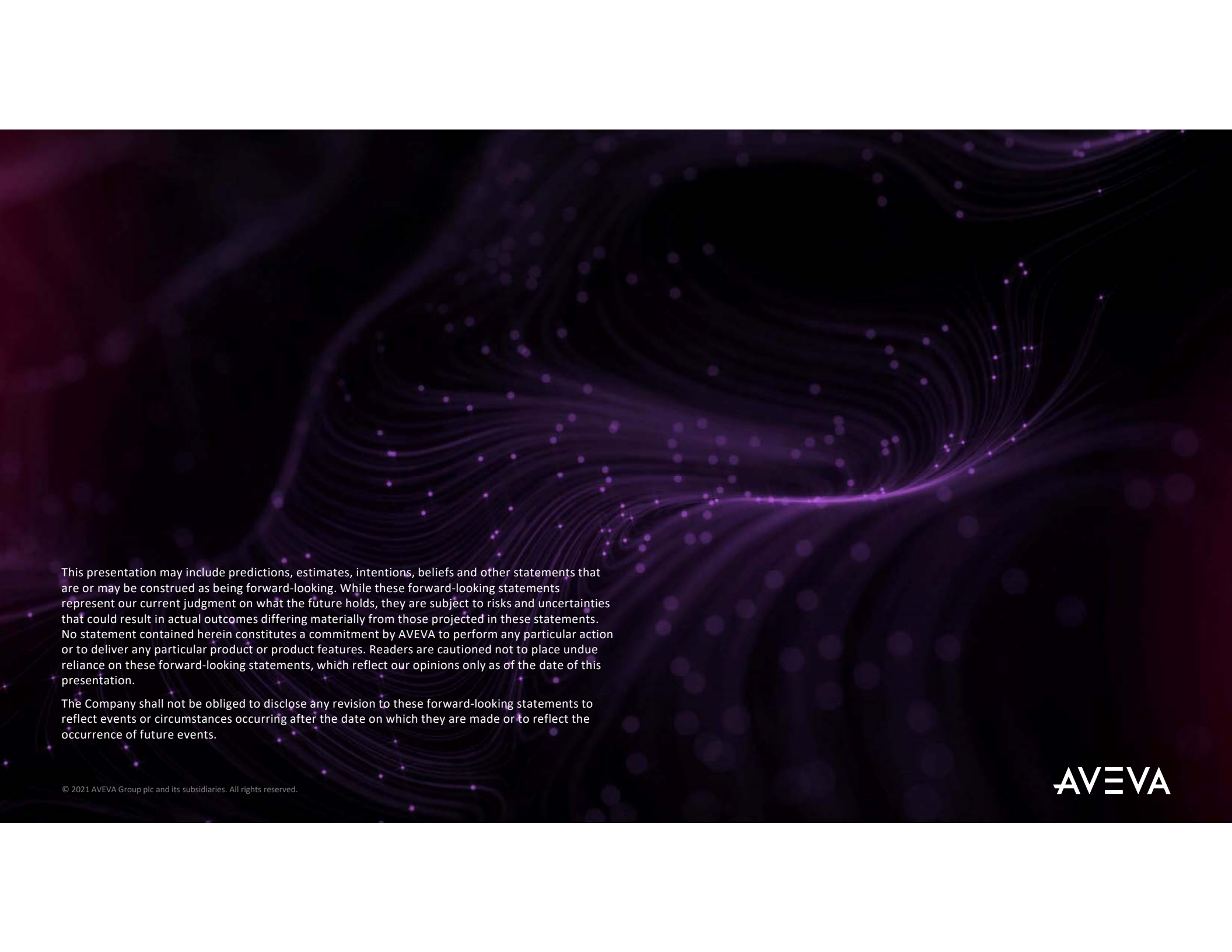


Jeremy Mahon

Senior Application Engineer

- DLL Solutions
- Jeremy @dllsolutions.com

Thank you for your time and interest in VELCO and AVEVA !



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