The Modern PI System for AMI Meter Data

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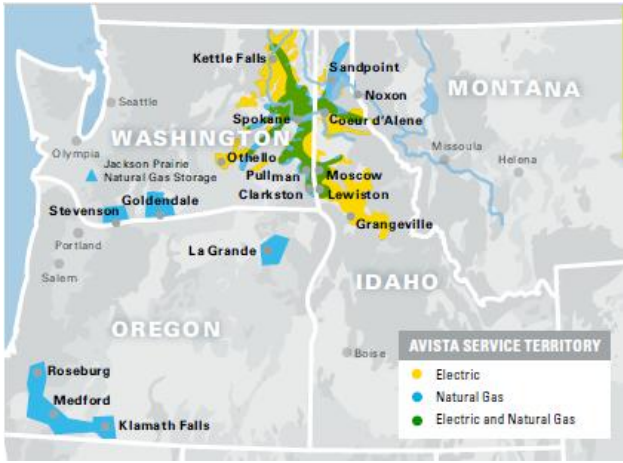
Conference Theme & Keywords

Avista

- Investor Owned Utility founded in 1889
- Annual Revenues of more than $1.4 billion
- 710,000 electric and gas customers
- 30,000 square mile service territory
- 2,250 miles of transmission line
- 19,000 miles of distribution line
- 7,700 miles of natural gas distribution mains
- Headquartered in Spokane, Washington
- Over 1,700 employees work in four western states



The Modern PI System for AMI Meter Data

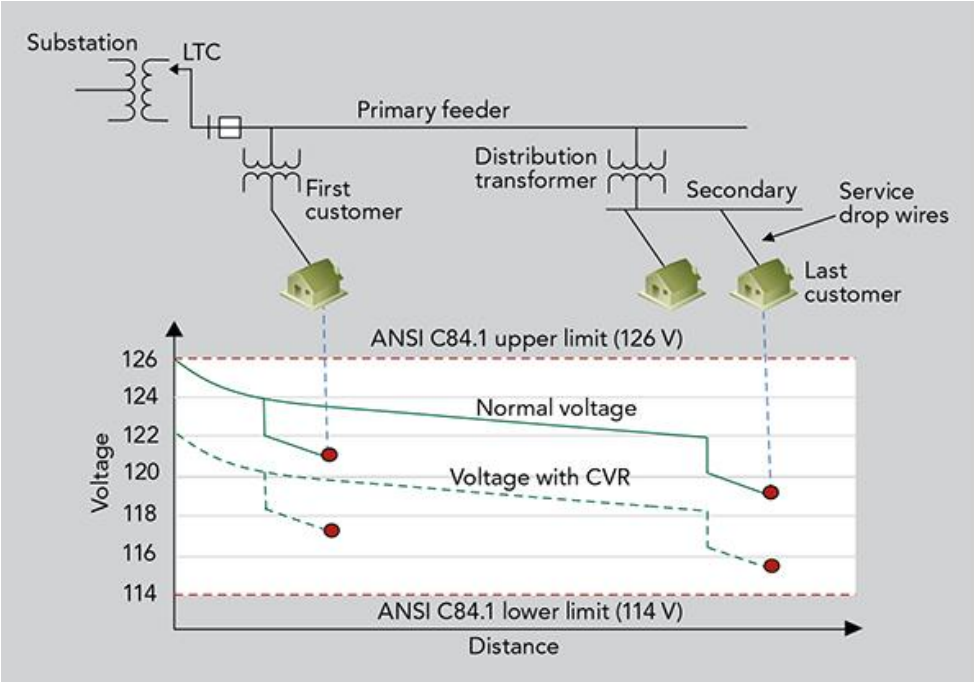
- Washington AMI Project
  - Conservation Voltage Reduction (CVR)
  - Pullman, WA SDGP AMI Project
- The Modern PI System
- Finding Problems
- Fixing Problems
- Future Plans

Washington AMI

- Interval Data for 400,000 meters
- MDM – Billing and Customer presentment
  - Not typically focused on traditional operational needs
- Benefits for Conservation Voltage Reduction (CVR)
  - Interval Data and Events for Operations

Avista CVR

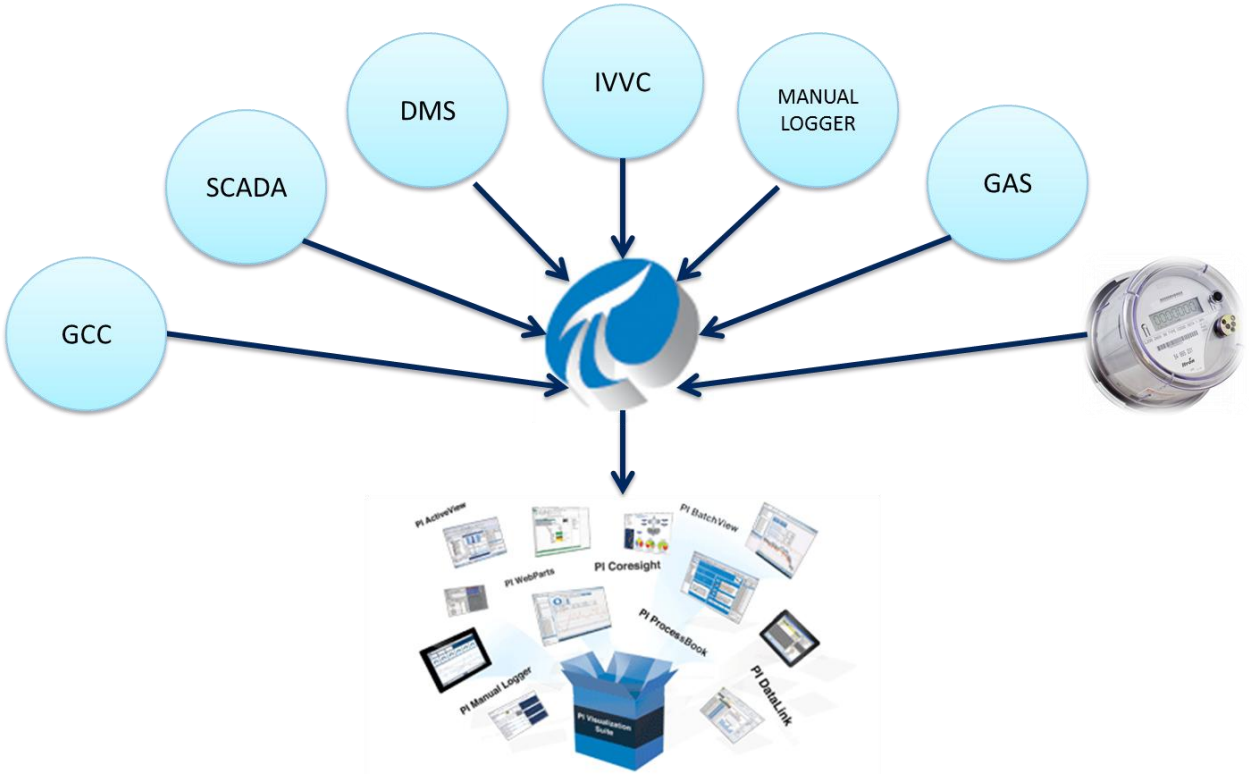
- CVR – Reduce Energy and Peak Demand



CVR Control

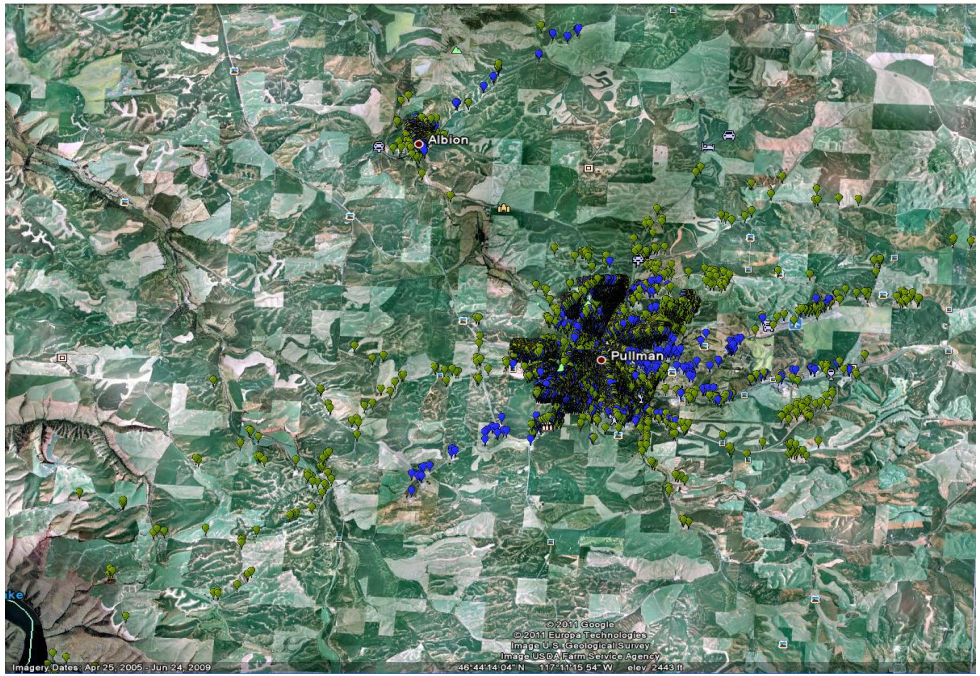
- Distribution Management System (DMS)
  - Integrated Volt and VAR Control (IVVC)
- Energy Management System (EMS or “SCADA”)
  - Remotely change Voltage Regulator settings
- Manual
  - Field personnel will be dispatched to change Voltage Regulator settings

PI for Operational Data

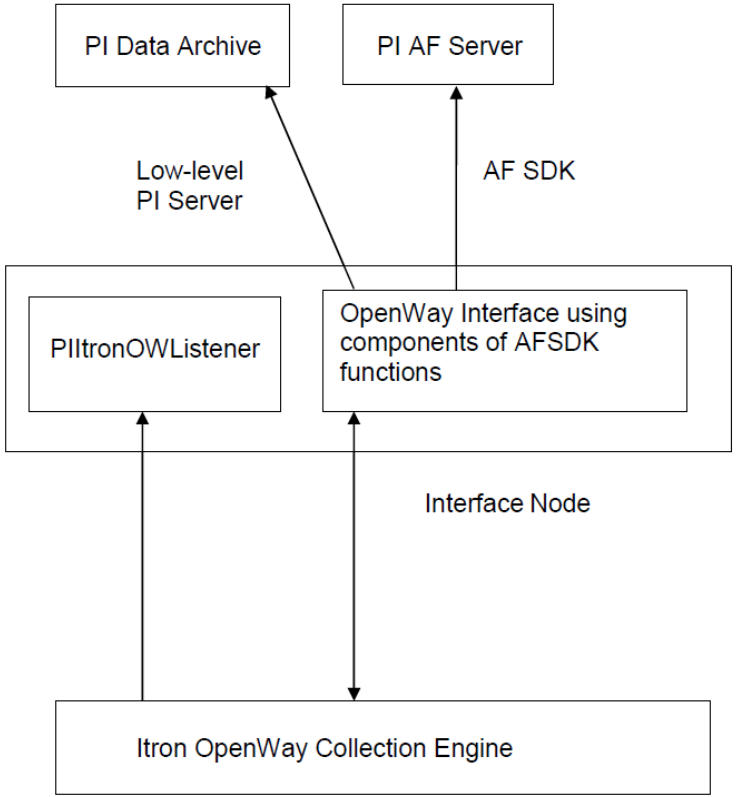


AMI Testbed in Pullman, WA

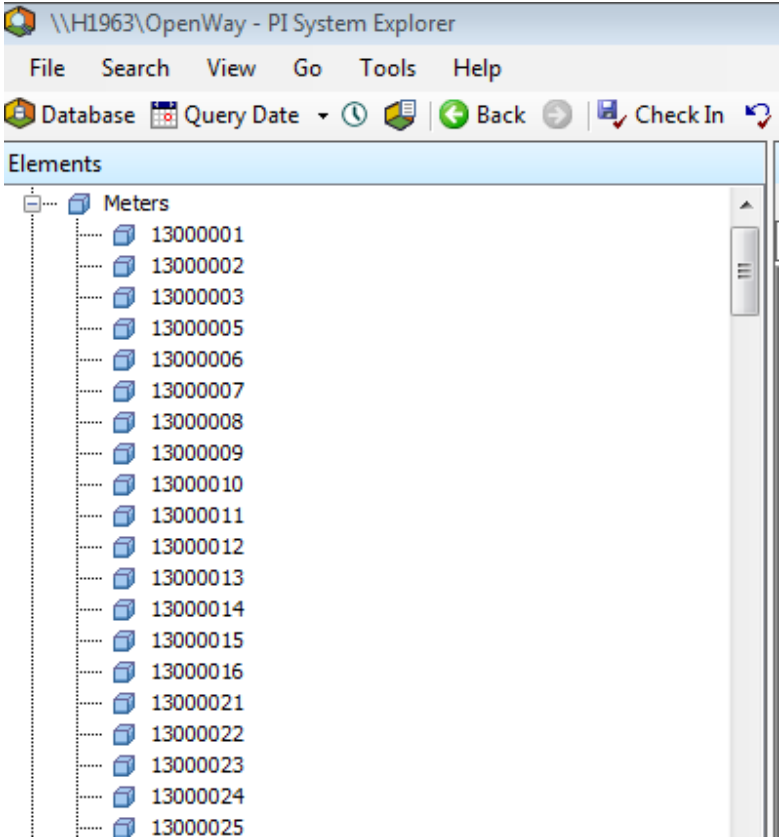
- SGDP Project in 2011
  - 15,000 Electric Meters



AMI Interface for Itron OpenWay



PI Magic!!! 15,000 meters

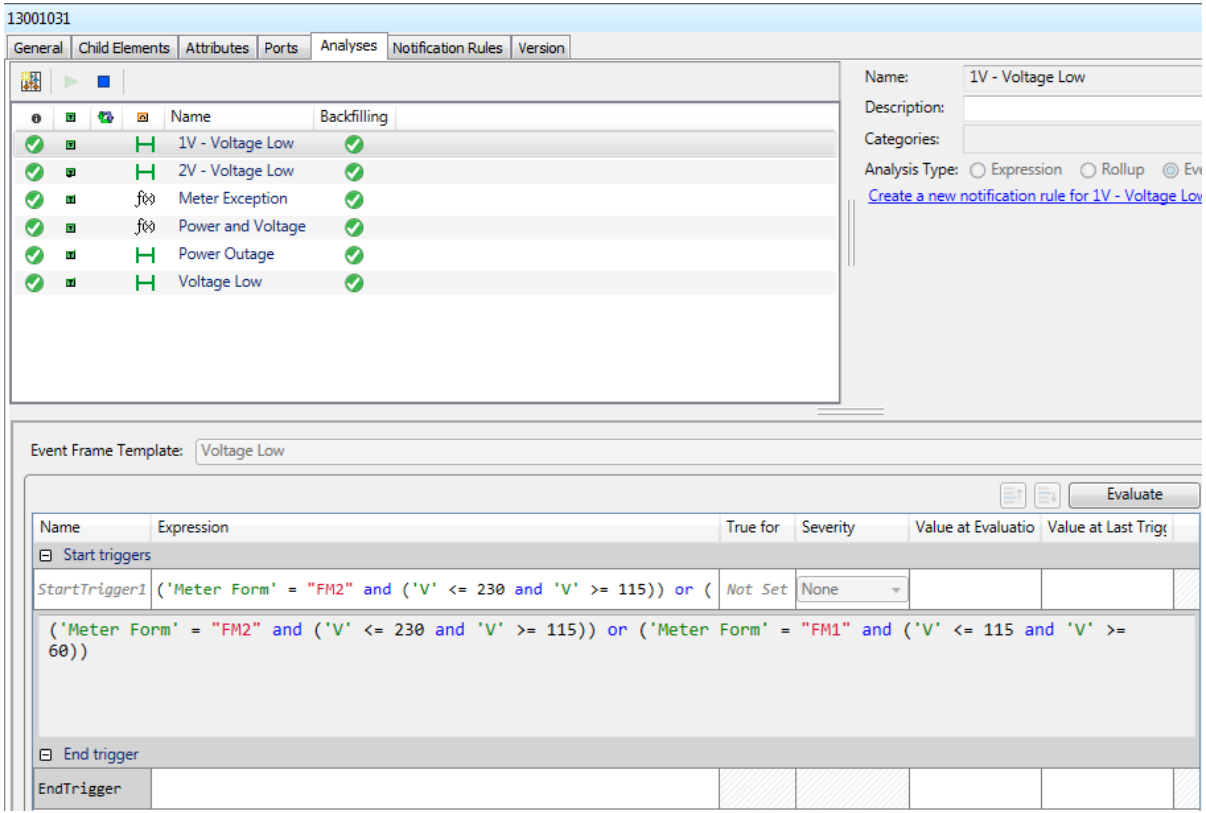


15,000 meters – With Context and Data

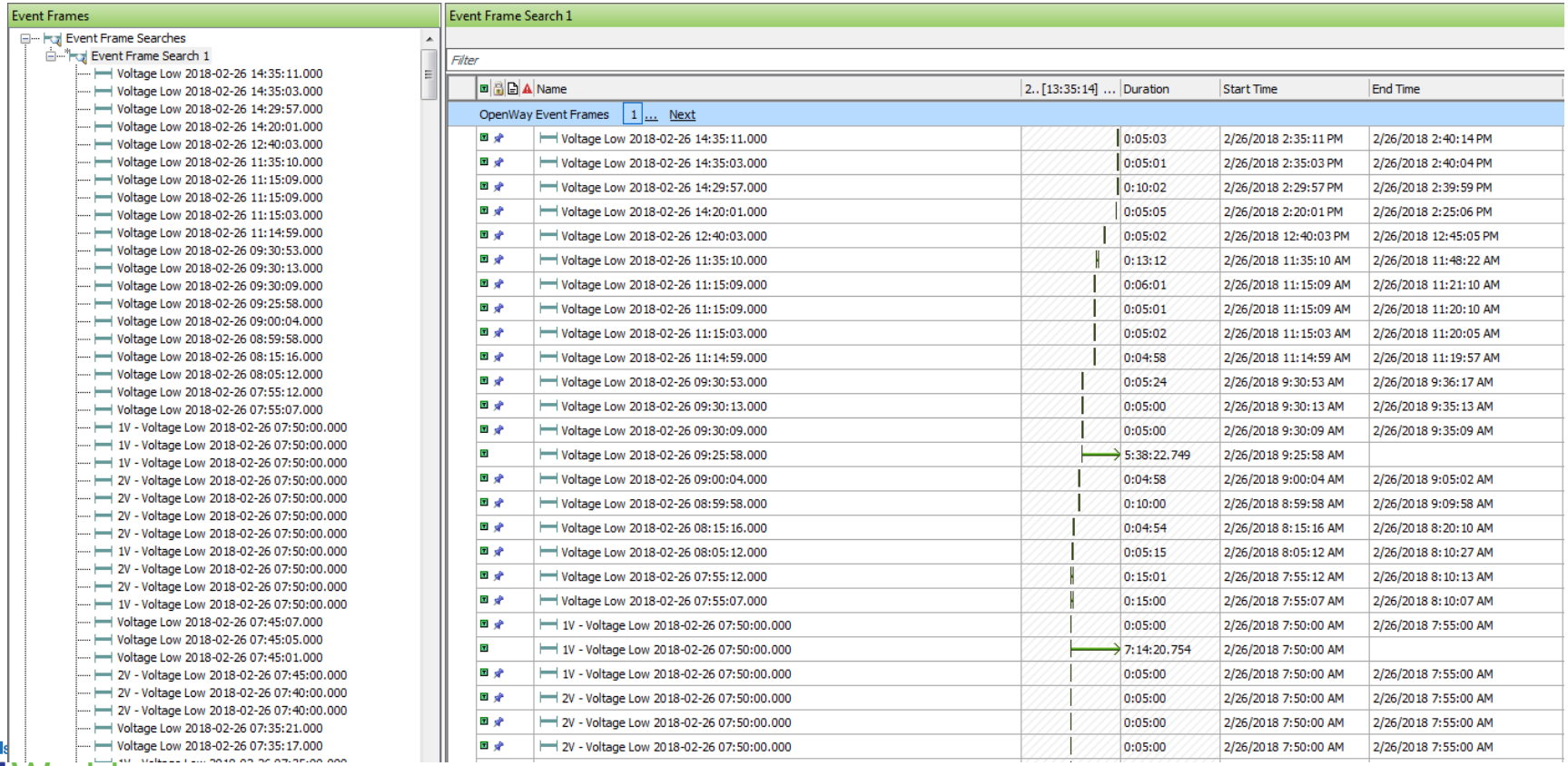
Category: Connectivity			
Feeder	TUR117	1/1/1970 12:00:00 AM	
Meter Number	13001020	1/1/1970 12:00:00 AM	
Service Length	35.5546882553731	1/1/1970 12:00:00 AM	
SPID	9820639264	1/1/1970 12:00:00 AM	
Transformer	AV00530 _ _	1/1/1970 12:00:00 AM	

Category: Voltage			
V	238.200004577637 V	2/26/2018 7:55:00 AM	
V - Inst	238.3	2/26/2018 8:40:25 AM	
V - Max	238.6	2/26/2018 7:55:00 AM	
V - Min	237.5	2/26/2018 7:55:00 AM	
Voltage Status	Shutdown	2/21/2018 7:24:03 PM	

What If Analysis



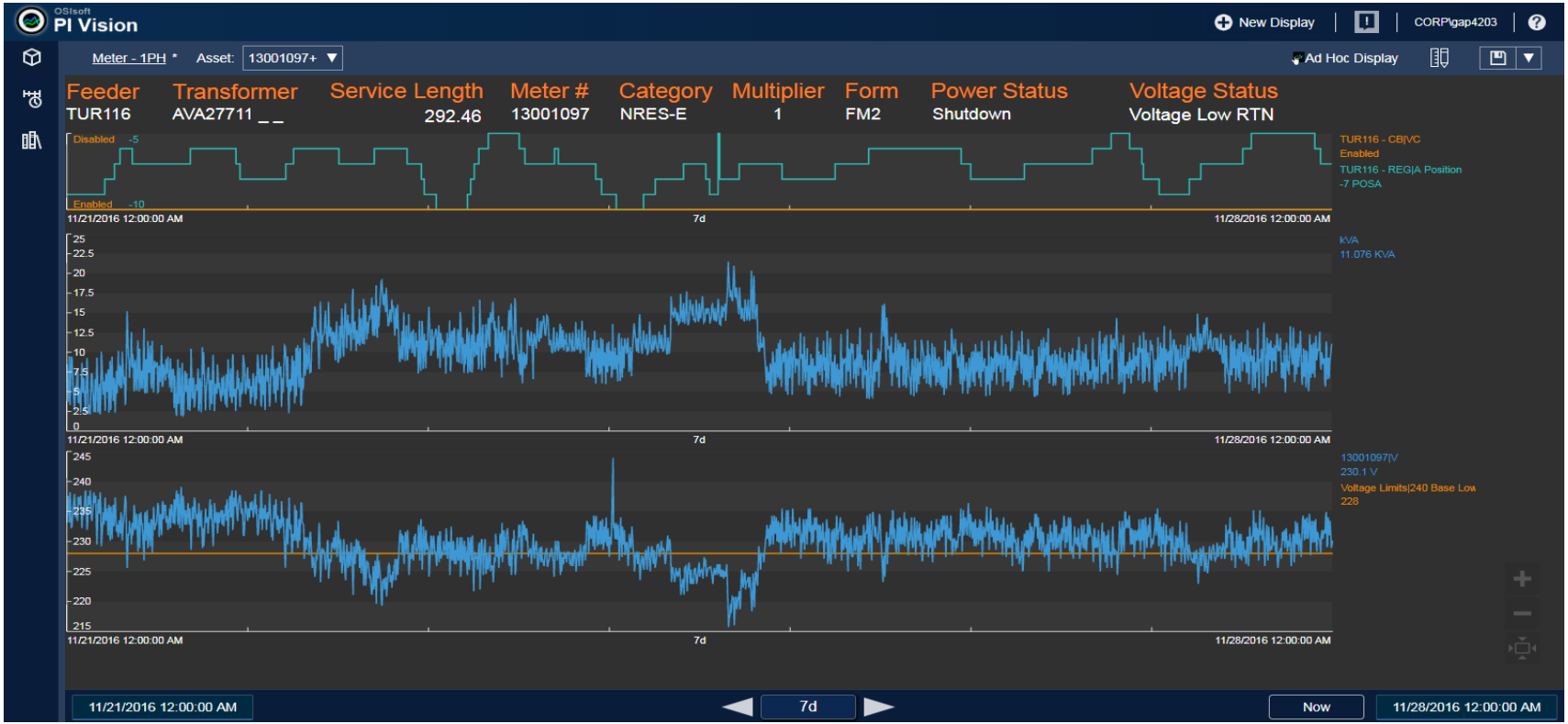
Event Frames



Back Office Analysis of Event Frames

	Row Labels	Count of Primary element		|Feeder		|Transformer
4	13000015	1476	13000015|Feeder	TUR116	13000015|Transformer	AVA27711 _ _
5	13001097	1341	13001097|Feeder	TUR116	13001097|Transformer	AVA27711 _ _
6	13013811	405	13013811|Feeder	SPU123	13013811|Transformer	_ _ AVA13122
7	13003922	362	13003922|Feeder	TUR113	13003922|Transformer	_ AVE06954 _
8	13002150	362	13002150|Feeder	TUR113	13002150|Transformer	_ AVE06954 _
9	13003923	359	13003923|Feeder	TUR113	13003923|Transformer	_ AVE06954 _
10	13003947	339	13003947|Feeder	TUR113	13003947|Transformer	_ AVE06954 _
11	13003349	332	13003349|Feeder	TUR113	13003349|Transformer	_ AVE06954 _
12	13013382	236	13013382|Feeder	TUR112	13013382|Transformer	SC3783 _ _
13	13001628	195	13001628|Feeder	TUR113	13001628|Transformer	_ _ PA1366
14	13011198	117	13011198|Feeder	TUR113	13011198|Transformer	_ AVE08895 _
15	13011200	108	13011200|Feeder	TUR113	13011200|Transformer	_ AVE08895 _
16	13011199	104	13011199|Feeder	TUR113	13011199|Transformer	_ AVE08895 _
17	13010234	98	13010234|Feeder	SPU121	13010234|Transformer	PA1939 PA1934 PA4992
18	13006023	92	13006023|Feeder	SPU121	13006023|Transformer	PA1939 PA1934 PA4992
19	13011980	74	13011980|Feeder	TUR113	13011980|Transformer	_ _ PA1366
20	13011978	68	13011978|Feeder	TUR113	13011978|Transformer	_ _ PA1366
21	13011979	66	13011979|Feeder	TUR113	13011979|Transformer	_ _ PA1366
22	13000893	64	13000893|Feeder	TUR116	13000893|Transformer	PA459 _ _
23	13014062	64	13014062|Feeder	TUR113	13014062|Transformer	_ _ PA1366
24	13003556	54	13003556|Feeder	TUR113	13003556|Transformer	PA5322 _ _
25	13005772	50	13005772|Feeder	SPU121	13005772|Transformer	_ _ ZAVA0465
26	13010462	49	13010462|Feeder	TUR113	13010462|Transformer	PA4508 AVA04212 _
27	13001627	46	13001627|Feeder	TUR113	13001627|Transformer	_ _ PA1366
28	13005381	45	13005381|Feeder	TUR116	13005381|Transformer	_ _ P9229
29	13011173	43	13011173|Feeder	TUR113	13011173|Transformer	_ _ PA1366
30	13011174	39	13011174|Feeder	TUR113	13011174|Transformer	_ _ PA1366
31	13003343	37	13003343|Feeder	TUR116	13003343|Transformer	_ _ P9229

Visualize the Problem

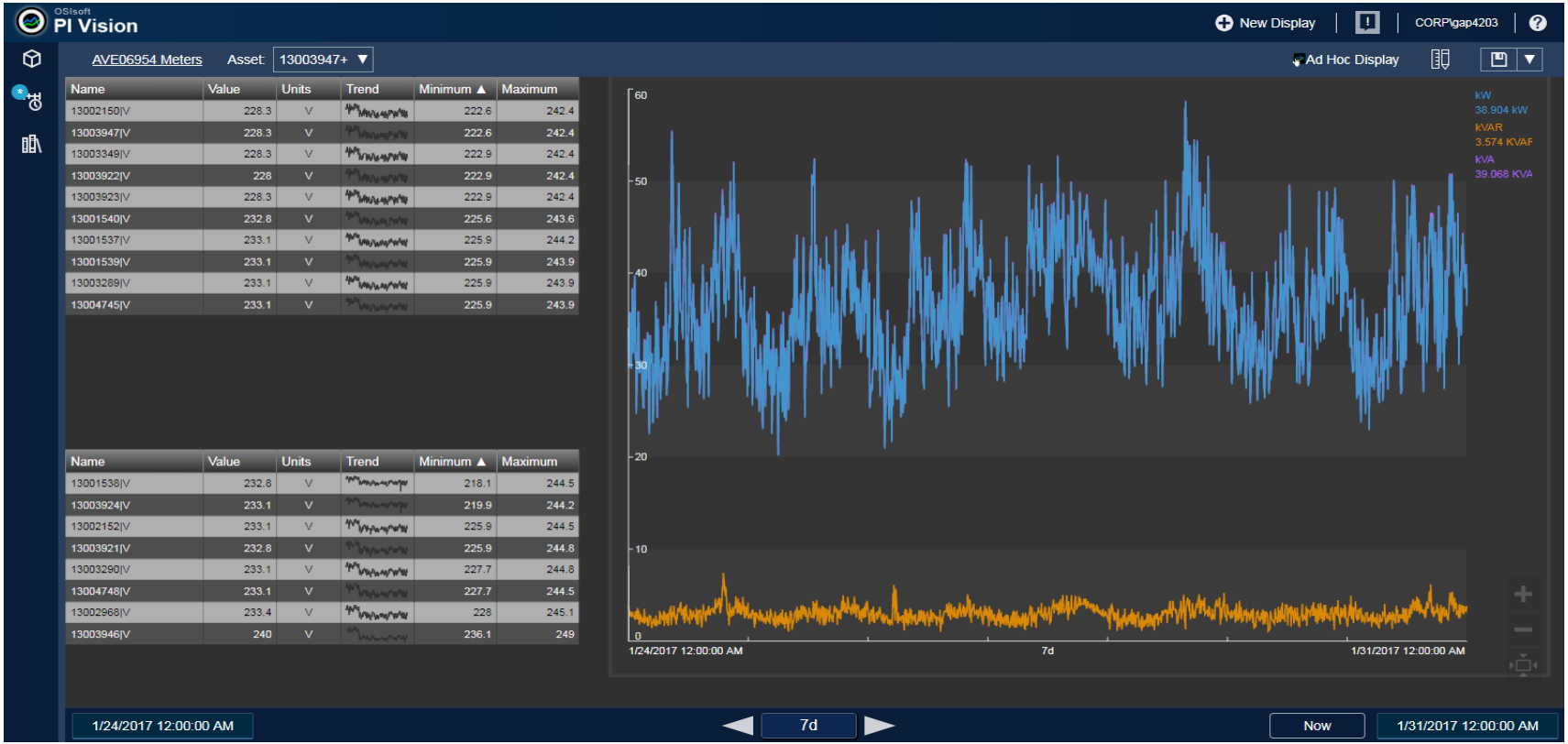


Correct the Problem

Visualize the Solution

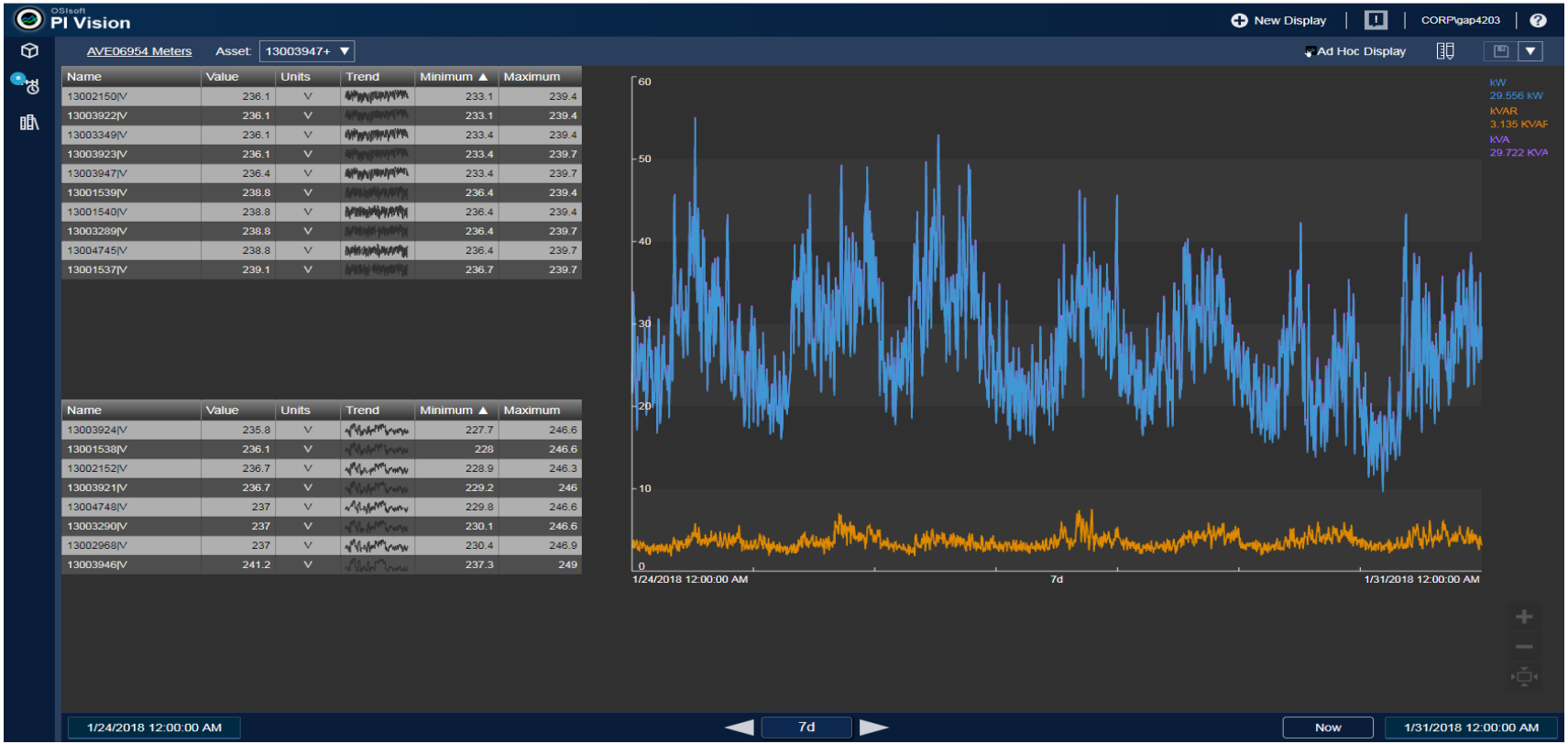
Correlate Data Across Assets

Visualize the Problem



Correct the Problem

Visualize the Solution



Users

- Distribution Operations Engineers
- Area Engineers
- Field Personnel

Future Plans

- Field Tools
- Integration to Maps
- Transformer Loading
- Reliability Metrics

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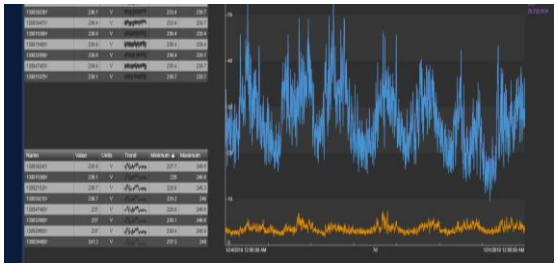
Leverage interval meter data to achieve operational benefits associated with the AMI business case.



CHALLENGE

Utilize AMI meter data to optimize system voltage for CVR benefits

- MDM systems are not typically focused on operational needs
- A solution to handle large volumes of data with analytics capabilities

SOLUTION

Utilize the Modern PI System to perform analysis and visualize problems and solutions

- AF Analyses provided the features needed to evaluate interval data
- Vision provided the means to visualize the interval data
- Context can be supplied to the data

RESULTS

The Modern PI System provided the means to analyze the system to achieve CVR benefits

- Analyses will help to pinpoint areas that need to be corrected
- Meter data has context with the rest of the system

Contact Information

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- Avista

Questions

Please wait for the **microphone** before asking your questions

State your **name & company**

Please remember to…

Complete the Online Survey for this session

Merci

谢谢

Danke

Спасибо

Gracias

Thank You

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ありがとう

Grazie

Obrigado

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