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Request IR-1:

(a) Please explain the need for the proposed Distributed Intelligence (DI) Apps Project, and what type of current system limitation the project is intended to address.

(b) Please explain how the project is expected to improve Nova Scotia Power's (NS Power) operations or customer service outcomes; and

(c) Please explain how this project is expected to improve existing operational, reliability, safety, planning, or customer-service issues.

Response IR-1:

(a) While the existing AMI and operational technology systems provide important metering, communications, outage detection, and device control functions, they were not designed to provide grid-edge visibility and distributed analytics at the level provided by DI Apps. NS Power's existing systems primarily collect and transmit data to centralized, head end utility systems for subsequent analysis. DI Apps perform analytics directly within smart meters, enabling real-time detection of operational conditions, localized decision-making, and enhanced situational awareness at the grid-edge. In addition, the Project includes back-office applications enabled by the DI Platform which aggregate and transform data from DI Apps into operational insights and decision-support tools. By transforming granular meter data into operational insights, DI Apps can provide insights into localized conditions and emerging trends that may not be reliably inferred from feeder-level measurements and centralized analysis alone. Through this project, NS Power will evaluate the operational value of DI Apps and their potential to provide insights to distribution system operations and support improved customer experience and more informed operational, planning, and asset management decisions.

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1 The project has the potential to improve operational decision-making, support more
2 effective planning activities, strengthen outage response capabilities, and enable earlier
3 identification of issues that may affect reliability, safety, or customer service. Itron DI Apps
4 have been successfully implemented in other utility jurisdictions, resulting in improved
5 grid visibility, enhanced detection of abnormal conditions, and more informed operational
6 decision-making. However, different utilities may experience different benefits as a result
7 of using DI Apps, and the efficacy of these technologies is subject to many variables,
8 including region-specific application. Accordingly, this Project is needed to test DI Apps
9 through limited deployment in order to develop core knowledge of these technologies in
10 NS Power's specific operating environment and collect data and learnings to determine
11 whether one or more of the DI Apps can provide feasible-long term solutions which can be
12 deployed at scale. Through limited deployment and testing of DI Apps, NS Power will
13 collect data to assess the functionality, performance, operational value, data quality, and
14 implementation requirements of the DI Apps before considering any larger-scale
15 investment.

16
17 (b) The project will evaluate the extent to which DI Apps can improve operations and customer
18 service by enhancing visibility into distribution system conditions and providing actionable
19 insights. Specifically, the project will evaluate the DI Apps abilities to improve:

- 20
21 • Outage management and restoration activities which support enhanced reliability
22 and improved customer experience;
23 • Identification and investigation of revenue loss related to energy theft, building
24 upon AMI system functionalities (such as service disconnect switches and tamper
25 alert messages) to further improve and automate processes associated with revenue
26 loss;
27 • Process automation and improved data availability relating to emerging asset and
28 safety-related issues to support more proactive identification and response with
29 potential to improve both operations and customer experience.

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- Visibility into distribution system connectivity and conditions to support distribution planning, advanced distribution operations applications, and operational investigations.
- Awareness of distributed energy resource (DER) activity, characteristics, and adoption patterns, to allow NS Power to better understand and support evolving customer behaviour

(c) This project will test the feasibility of DI Apps to determine whether, if deployed at a broader scale, one or more of the DI Apps can address existing operational, reliability, safety, planning, or customer-service limitations, such as:

- Operational/reliability/planning: inability to remotely validate meter-to-transformer, feeder, and phase connectivity relationships at scale across the system;
- Operational/reliability: limited real-time visibility into distribution system conditions at the grid-edge;
- Operational/reliability/planning: limited visibility into emerging distribution system conditions, including electric vehicle charging behaviour; and
- Safety: limited ability to proactively identify certain safety-related conditions occurring at the grid edge.

As this project is being undertaken as a pilot under the Innovation Justification Criteria, the extent to which these outcomes can be achieved has not yet been established. A primary objective of the pilot is to evaluate the functionality and operational value of the DI applications, assess their ability to address the limitations described above, and determine whether sufficient customer and operational benefits exist to support broader deployment.

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Request IR-2:

Please provide all reports, studies, assessments, vendor materials, and industry references that NS Power relied on to support the need for the project.

Response IR-2:

Please refer to Attachments 1-9. Details about each Attachment are provided below.

Attachment 1: Project Opportunity Assessment

- An assessment of the opportunities provided by the various Itron DI Apps initially under consideration for the pilot project, and the initial list of DI Apps recommended by the project team for testing through the pilot project. The presentation was developed by the project team using information provided by Itron. The presentation was delivered to the Project Sponsor and Technology Planning Team to obtain support for the proposed DI Apps.
- Includes:
 - High-level selection criteria for applications under consideration for pilot testing;
 - Recommended applications as of November 2025 (subject to change as project development progresses);
 - Summary of each DI App;
 - Scoring matrix, based on potential added value of the DI App, current state, and complexity to implement the application; and
 - Technology matrix summarizing the technologies enabled by each DI App.

Attachment 2: Itron Location Awareness Brochure

- An Itron Brochure which describes Location Awareness capability within Itron's DI Platform.

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- Explains how meter-based analytics can be used to identify and maintain information regarding the electrical connectivity of meters, including their associated transformer, feeder, and phase, to support distribution system monitoring, outage management, transformer load analysis, theft detection, and other grid operations applications.

Attachment 3: Itron DI Applications Update

- Provides an overview of the Distributed Intelligence (DI) platform and its suite of meter-based applications.
- Describes the architecture, functionality, implementation status, and intended utility applications of various DI capabilities.

Attachment 4: Itron Market Intelligence & Business Value Analysis

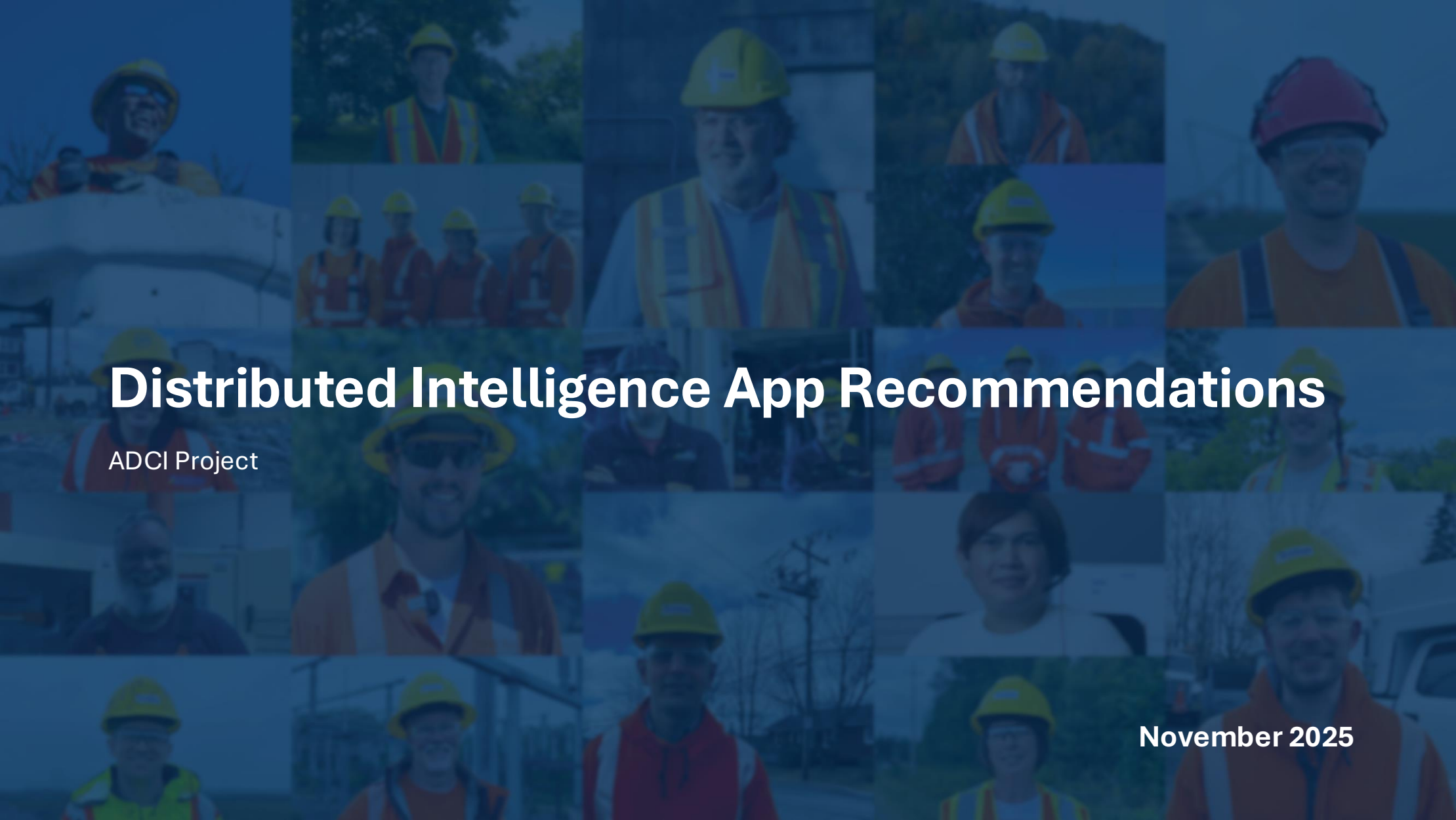
- Provides an overview of the potential business value of DI Apps as well as case study details that highlights operational outcomes, accuracy metrics, and reported benefits from utility implementations of Distributed Intelligence applications.
- Includes examples from utilities such as CenterPoint Energy (CNP), PG&E, Xcel Energy, Tampa Electric (TECO), and LUMA Energy.
- Describes how DI applications have been used to support grid monitoring, safety, asset management, outage prevention, theft detection, and distribution system visibility.

Confidential Attachments 5-9: Other Industry References

- Various presentations obtained through regular engagement with industry working groups, and utility conferences where Itron's DI App technologies, use cases, benefits, and implementation considerations were presented and discussed.
- An analysis of 30 edge computing deployments which provides insights into edge-hosted data.

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- 1 • A Market Guide providing information on various edge computing solutions and the
2 direction of the market.



Distributed Intelligence App Recommendations

ADCI Project

November 2025

DI App Pilot Selection Criteria

- Value-add via increased operational efficiency and/or better customer experience
- Current processes and/or software used to achieve similar utility (if they exist)
- Complexity to test and validate.
- Integrations needed to test and/or operationalize App
- Technologies used by App

Current Recommendations

Discrete Apps

- Location Awareness
- Meter Bypass Detection
- Advanced Temperature Monitoring
- EV Awareness

Back-office Analytics*

- Feeder Visibility
- Advanced Outage Awareness

*Requires additional ATVM/ATLM app to function

Location Awareness

Autonomously determines which phase, feeder and transformer meters are on using peer-to-peer communication and GIS data and highlights errors in the GIS model

Benefits

- Pre-cursor to many future improvements in system operations and distribution planning
- Reduces revenue loss due to stolen/switched meters, ghost meters
- Reduced truck rolls
- Proactively identifies field work errors
- Improved outage response

Challenges

- Requires GIS integration to test and operationalize



Future State: An accurate GIS model with phase data lays the ground for advanced grid functions such as one-phase operation, load flow and DERMS.

Meter Bypass Detection

Detects attempts to bypass the meter for power theft using high-resolution sampling of voltage and current data

Benefits

- Proactively reduces revenue loss – currently a reactive, labor-intensive process to identify
- Proactively identifies unsafe conditions
- Low effort to deploy and test
- Can be integrated with CIS long-term

Challenges

- Report will need to be worked manually during pilot
- Optics/Equity concerns as this could disproportionately affect some groups



Future State: Meter bypasses are autonomously identified and dispatched to the field/corporate security to rectify.

Advanced Temperature Monitoring

Uses high-resolution temperature readings and peer-to-peer communication to detect meter socket problems before they create a safety hazard or interrupt service

Benefits

- Proactively identifies and prevents unsafe conditions for customers
- Less false-positives (e.g. meters in the sun in summer)
- Labor savings through reduced SMOC intervention and fewer unplanned truck rolls

Challenges

- Needs to be integrated into ADMS/CIS for full benefit



Future State: Unsafe meter sockets are autonomously identified and dispatched to the field before they become a safety hazard

EV Awareness

Provides near-real-time disaggregation information for when an electric vehicle begins or stops charging.

Benefits

- Opens the door to localized EV charging control if tied into DERMS
- Could realize customer benefit during pilot using existing notification systems
- Visibility into real-time/long-term charging patterns
- Data is likely to be more accurate than Bidgely Analytics (fits disaggregation model on 15-minute interval data)

Challenges

- No immediate use/benefit if not tied into DERMS



Future State: DI events trigger EV charges to stop/start as needed, leading to more automated system planning and happier customers

Feeder Visibility / Advanced Outage Awareness

Back-office analytics that use data from multiple DI apps to provide dashboards for power factor and load flow management as well as outage scope determination

Benefits

- Low-effort solution to evaluate ATVM/ATLM data short-term without a robust ADMS integration.
- Uses machine-learning algorithms to forecast future states

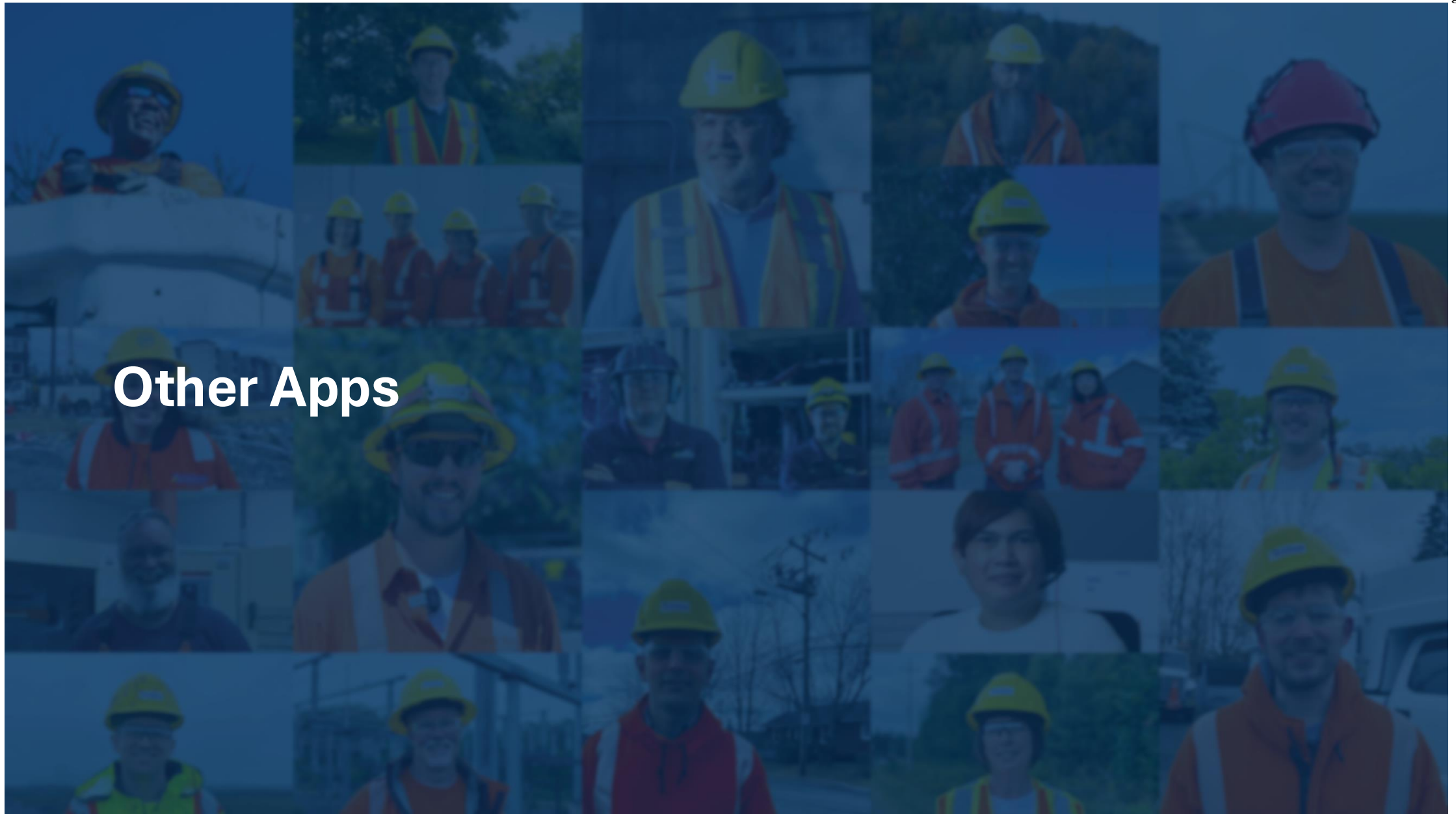
Challenges

- Significant data validation required before it can be trusted in operations
- Requires human intervention to make system and scheduling changes
- Requires 2 additional apps to function
- Still under development by Itron



Future State: System operators use these dashboards to make decisions during daily/storm operations as a stop-gap until data flows directly into ADMS.

Other Apps



Advanced Transformer Voltage & Load Monitoring

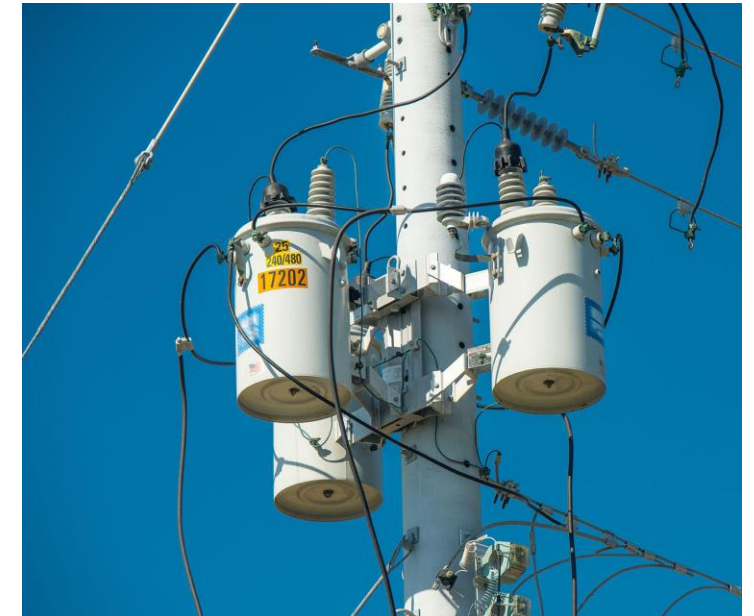
Near real-time monitoring of distribution transformer load statistics and premise voltage statistics

Benefits

- Better load planning, voltage regulation and system operation in areas without SCADA
- Real-time visibility into system voltage/load at a granular level

Challenges

- Significant ADMS upgrade + development needed to realize benefits
- Location awareness must be deployed fully first
- Fundamental changes in operations/planning guidelines
- HW 4.0 meters are incompatible with ATLM



Future State: ATVM/ATLM data drives grid planning and operations through a combination of autonomous and manual operator decisions.

Solar Awareness

Provides near-real-time disaggregation information for solar generation.

Benefits

- Opens the door to localized solar control if tied into DERMS
 - Better system planning
- Visibility into real-time/long-term generation patterns
- Data is likely to be more accurate than Bidgely Analytics (fits disaggregation model on 15-minute interval data)

Challenges

- No immediate use/benefit if not tied into DERMS



Future State: DI events control how much energy is sent back to the grid leading to more automated system planning

High Impedance Detection

Detects and locates poor electrical connections in low voltage secondaries before they create a safety hazard or interrupt service

Benefits

- Increased visibility into secondary infrastructure; could be used to build out model
- Less unplanned outages

Challenges

- May not have the field resources to proactively address issues (process is currently customer initiated)
- Low excitement from business stakeholders



Future State: DI data autonomously identifies poor electrical connections and dispatches field resources to address them

Voltage Insights

Provides premise-level CBEMA/ITIC curve voltage tracking and IEEE 519 harmonics data.

Benefits

- Proactively identifies power quality issues at a premise level

Challenges

- May not have the field resources to proactively address issues (process is currently customer initiated)
- Similar outcomes could be obtained by analyzing historical data
- Low volume of customer complaints



Future State: DI data autonomously identifies power quality issues and dispatches field resources to address them

DER Readiness

Back-office analytics that use data from multiple DI apps to provide dashboards that estimate how ready secondary infrastructure is for new EV, solar and other DER connections.

Benefits

- Low-effort solution to evaluate ATVM/ATLM & High Impedance data short-term without a robust ADMS integrations

Challenges

- Low excitement from business stakeholders
- Requires 3 additional apps to function
- Still under development by Itron



Future State: System operators use these dashboards to decide if a DER device can be installed as a stop-gap until data flows directly into ADMS.

Scoring Matrix

App	Added Value	Current State	Implementation Complexity
Location Awareness	Very High	Poor	Medium
Meter Bypass Detection	High	None	Low
Advanced Temperature Monitoring	Medium	Good	Low
EV (Electric Vehicle) Awareness	Medium	None	Medium
Solar Awareness	Medium	Poor	Medium
Feeder Visibility / Advanced Outage Awareness	Medium	Poor	Low
High Impedance Detection	Low	Poor	Medium
Advanced Transformer Voltage Monitoring	Medium	Good	Very High
Advanced Transformer Load Monitoring	Medium	Good	Very High
Virtual RTU – MS Fabric Interface to ADMS	Medium	Good	Very High
Voltage Insights	Low	Poor	High

Technology Matrix

App	Peer-to-Peer Communications	Multi-Meter Aggregatio	Spokes Meter	1 second Data Analysis	Event Notification to HE	Disaggregation
Location Awareness	X	X	X			
Meter Bypass Detection	X				X	
Advanced Temperature Monitoring				X	X	
EV (Electric Vehicle) Awareness				X		X
Solar Awareness				X		X
Feeder Visibility / Advanced Outage Awareness	X	X	X	X	X	
High Impedance Detection				X	X	
Advanced Transformer Voltage Monitoring	X	X	X	X		
Advanced Transformer Load Monitoring	X	X	X	X		
Virtual RTU – MS Fabric Interface to ADMS						
Voltage Insights				X		



Location Awareness

Distributed Intelligence

Effectively using your smart meters to support monitoring and control of your secondary distribution requires knowing exactly where they are in your distribution network.

One of the greatest challenges to the evolution of the electric distribution grid is the inability of smart meters and other equipment to know precisely how they are connected to the distribution grid. This lack of operational information impacts all aspects of grid operations from load control of distributed energy resources and intelligent switching to phase balancing and system reliability.

Now, for the first time, smart meters using Itron distributed intelligence can be continuously aware of their electrical connectivity in relation to other grid assets. This awareness does not require a GIS component nor is it dependent on the topology of the communications network. Rather it's enabled by continuous monitoring and analysis of electrical characteristics relative to other devices on the network.

This capability, called Location Awareness, is a fundamental breakthrough in the Itron network and distributed intelligence platforms, which enable an entirely new frontier of smart grid use cases and applications not achievable without timely and reliable connectivity data.

The Value of Location Awareness

- » Sub-second data resolution provides higher accuracy than previously possible
- » Requires significantly less back office infrastructure and data science expertise
- » Device self-awareness of electrical location greatly improves many outcomes such as outage and theft detection, and network connectivity
- » PLC connectivity delivers accurate and rapid phase detection and transformer connectivity
- » Typically, can realize more than \$2M per year in added business case value for utilities with >1 million customers



Based on Itron research with utility customers, the accuracy of connectivity data can vary greatly, with many lacking accurate and updated connectivity data for 10, 20 or even 50 percent of their delivery points. Many rely solely on outdated, as-built engineering drawings from decades ago or imprecise GIS data to make educated guesses on connectivity.

Itron's patented Location Awareness analysis, available with the Itron network and distributed intelligence solution, identifies the electrical connectivity of each meter on the distribution network. In conjunction with your GIS mapping, the algorithms determine the connected transformer, circuit phase and feeder of each service point and continually update operators with a highly accurate connectivity model. Discrepancies between your GIS grid model and the algorithmic connectivity computation are highlighted for your field crews to review and inspect.

This unprecedented visibility into connectivity enables Itron to unlock tremendous new value in distribution operations. This information greatly increases the effectiveness of existing processes such as outage and theft detection, transformer load management and demand response, while also enabling entirely new applications like the detection of potentially unsafe grid conditions such as high-impedance connections (HIC) and downed conductors. Location Awareness enables operators to execute localized grid operation use cases with much more confidence and precision than ever before possible.

BUSINESS VALUE

A highly accurate and precise connectivity model is critical for ensuring proper power flow in your distribution grid. As the electrification of transportation adds more load and harmonics to your distribution grid, phase balancing, transformer load management, demand response, outage detection and energy

diversion detection are just some of the use cases that take on a whole new level of precision and effectiveness when devices know their location in the context of the distribution network.

For transformer load management or demand response, specific loads and distributed generation assets can be controlled to flatten peak loads and manage the grid in a targeted and coordinated manner. The accuracy and timeliness of outage and high impedance detection is greatly increased.



Location Awareness: Meter-to-Transformer Visualization of Groupings

Location Awareness is a fundamental capability of the Itron network and distributed intelligence platforms where intelligent devices continuously analyze data at the edge, communicate and collaborate with each other, and ultimately make decisions in near real-time. When meters and other edge devices are aware of their exact location on the grid, and other devices they are connected to, grid operators are able to solve problems, manage rapidly changing conditions and create new opportunities never before possible.



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The background of the slide is a nighttime photograph of a city street. On the left, there is a cobblestone street with blurred light trails from cars. A large tree stands in the middle ground. On the right, there is a sidewalk and a decorative metal railing. In the distance, city lights and a tall monument are visible.

DI Applications Update

Distributed Intelligence

... distributing *analytics* to the edge

- » analysis
- » decision making
- » action



Moving the solution closer to the problem

Grid Edge Intelligence Base Requirements

A Grid Edge platform should provide:



Every meter is a grid condition-sensing waveform analyzer



Distributed intelligence extends the value of **every** meter



High resolution processing locally pushed to distribution load flow



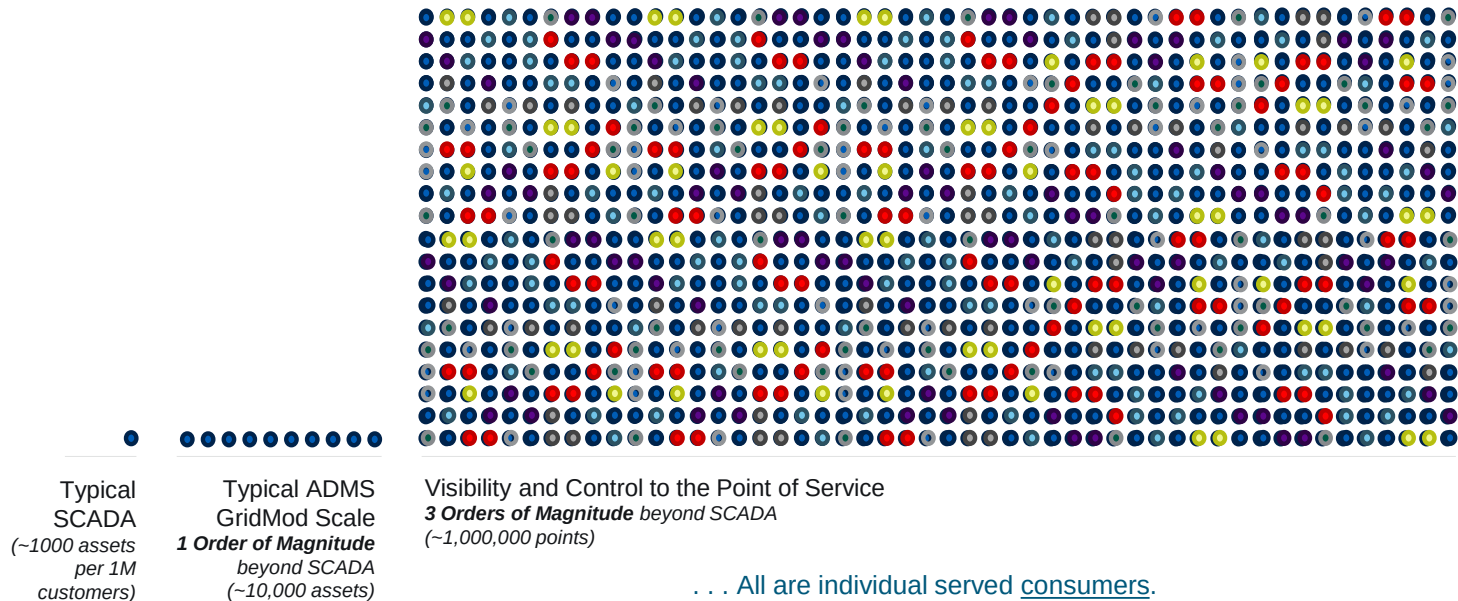
Peer-to-peer communications among meters and devices



Multiple simultaneous network comms - RF, PLC, Wi-Fi, Cellular

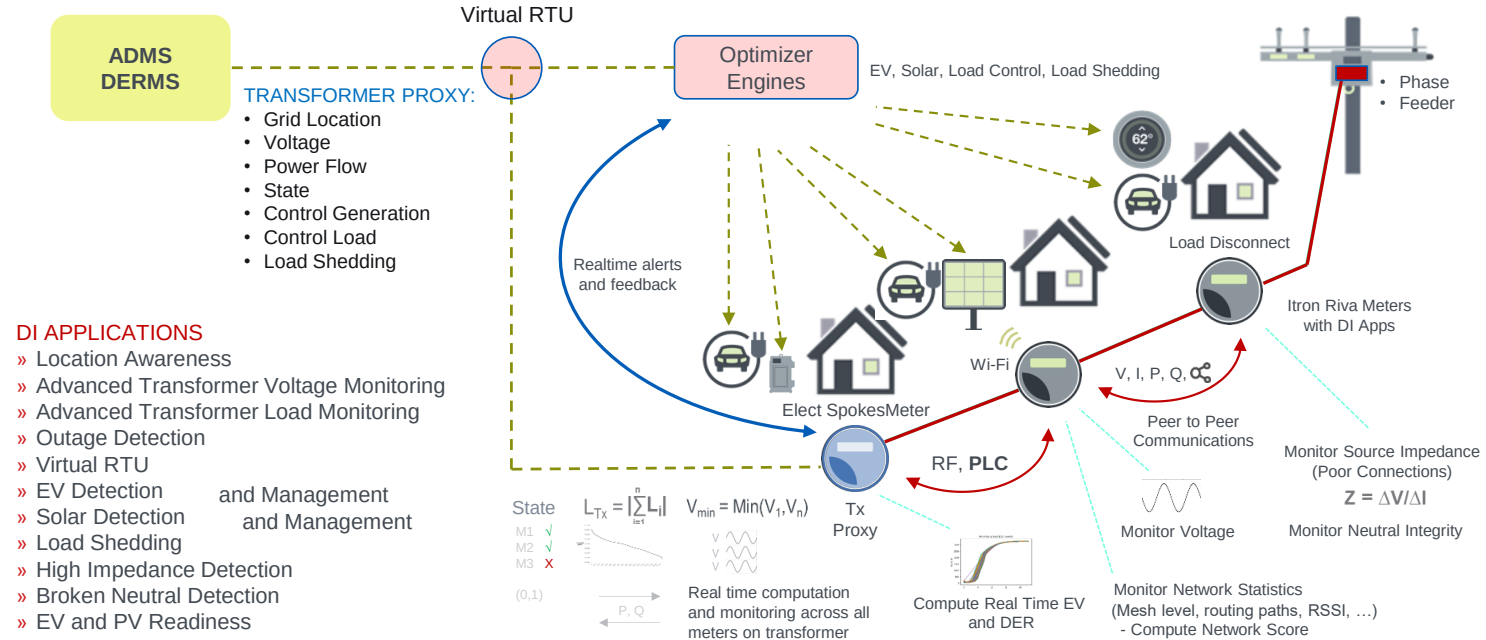
Grid Edge Visibility – the Scale Challenge

DI is Visibility, monitoring and control in the low voltage network at scale

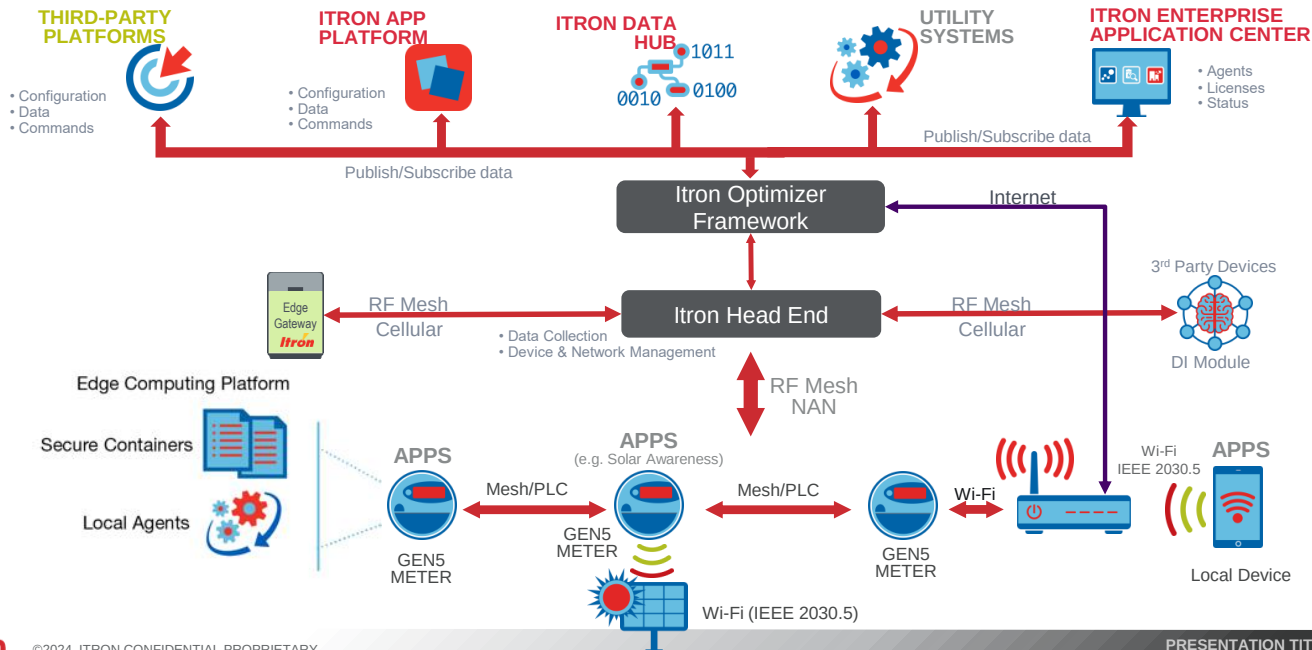


Monitoring and Managing the Low Voltage Grid

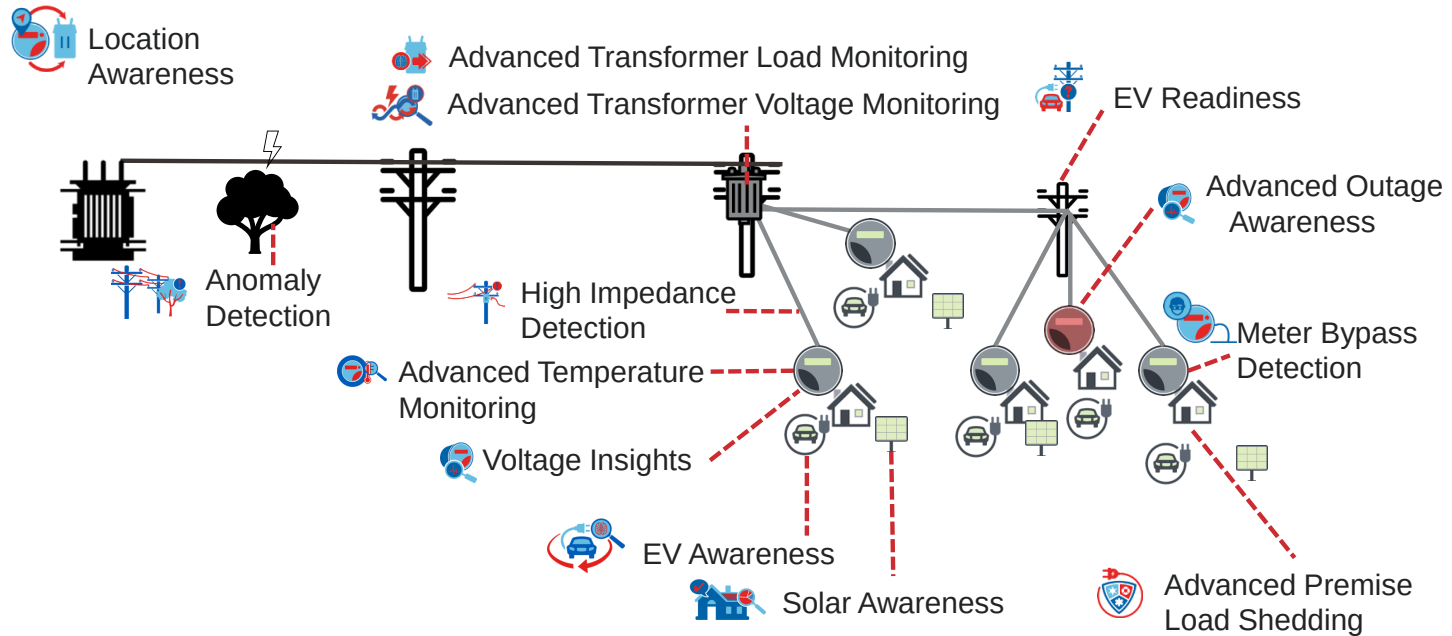
DI Integration with Grid Management



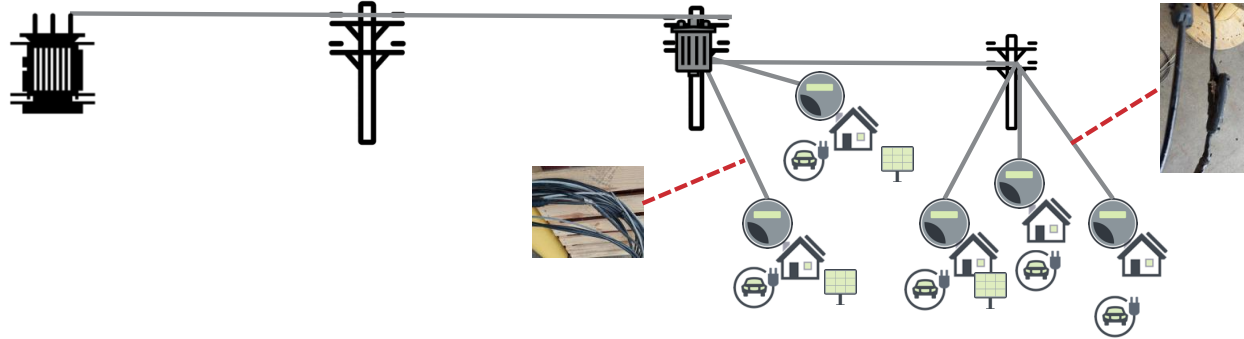
How It Works – Simplified DI Architecture



Itron DI Apps: Monitoring & Managing the Distribution Grid



High Impedance Detection



Distribution Operations – Trouble Dept, Risk & Reliability Managers

Unpredictable and unplanned outages cause too much spending crew overtime, and it's difficult to plan effectively. Customer satisfaction is impacted.

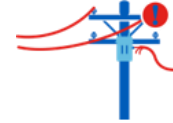
High Impedance Detection

Production

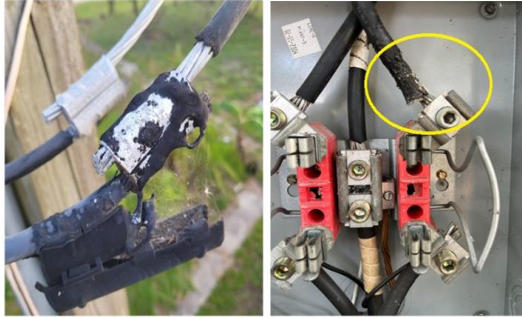
Detects and locates poor electrical (high impedance) connections in low voltage secondaries before they create a safety hazard or interrupt service

Analysis and field validation to date:

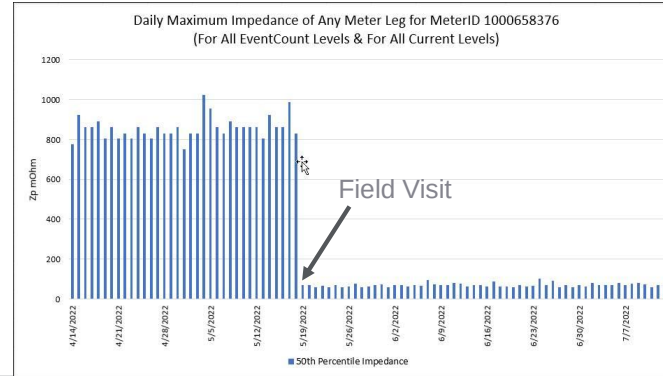
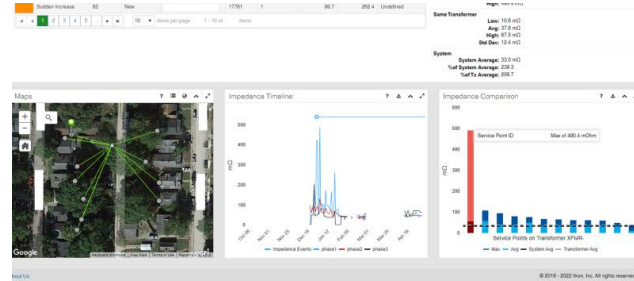
- » Exceeds success criteria
 - 93% accuracy over sample of > 200 field investigations
- » Core value drivers include decreased customer outage minutes, as well as safety and customer satisfaction



High Impedance Detection – Field Examples

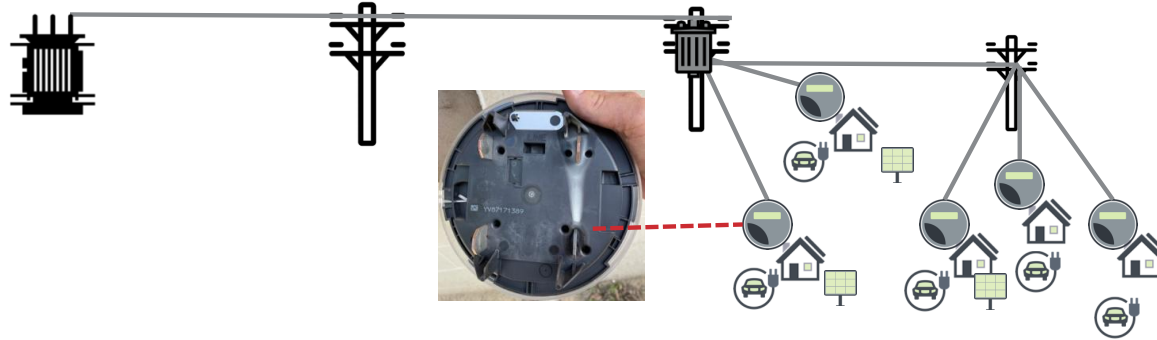


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HOME

Advanced Temperature Monitoring



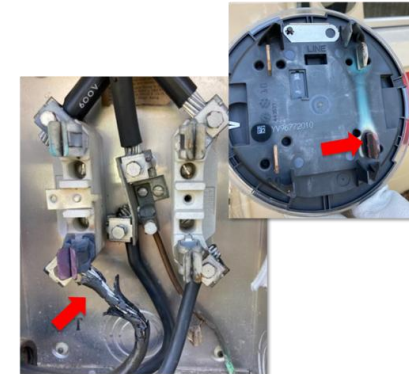
Distribution Operations – Trouble Dept, Risk & Reliability Managers

Unpredictable and unplanned outages cause too much spending crew overtime, and it's difficult to plan effectively. Customer satisfaction is impacted.

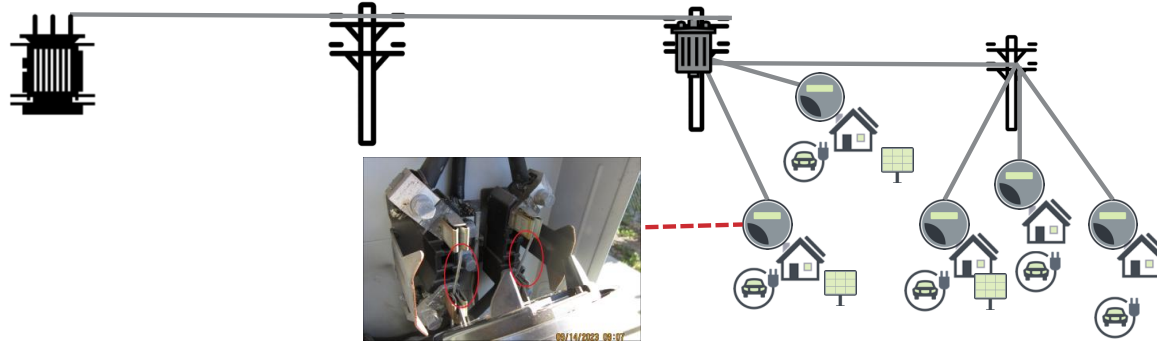
Advanced Temperature Monitoring

Production

- » Uses high-resolution temperature readings to detect meter socket problems before they create a safety hazard or interrupt service
- » Analysis and field validation to date:
 - Exceeds success criteria
 - 91% accuracy over sample of > 200 field investigations
 - Core value drivers include decreased customer outage minutes, as well as safety and customer satisfaction



Meter Bypass



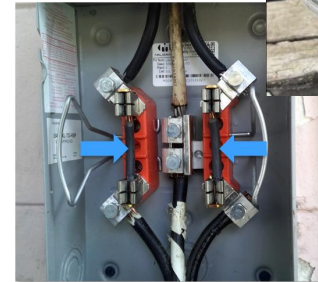
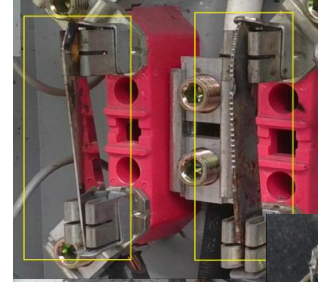
Revenue Assurance Team

You don't have meter readers in the field anymore, with AMI. However, you want insight on theft, capturing value from backbilling and avoided future losses.

Meter Bypass

Production

- » **Function:** Detects meter bypass and theft conditions
- » **Benefits:**
 - Revenue assurance
 - Addresses potential safety concerns
- » **Outputs:**
 - Prioritized recommendations list, .csv through UI or integrated into work order management system



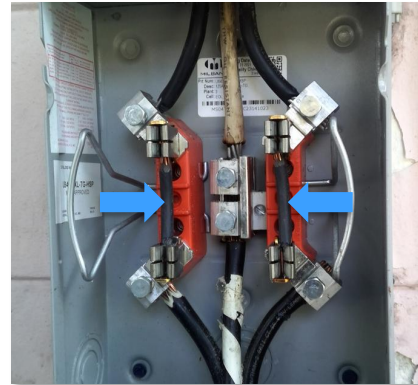
Meter Bypass – Field Examples



Secondary tap – safety and fire hazard

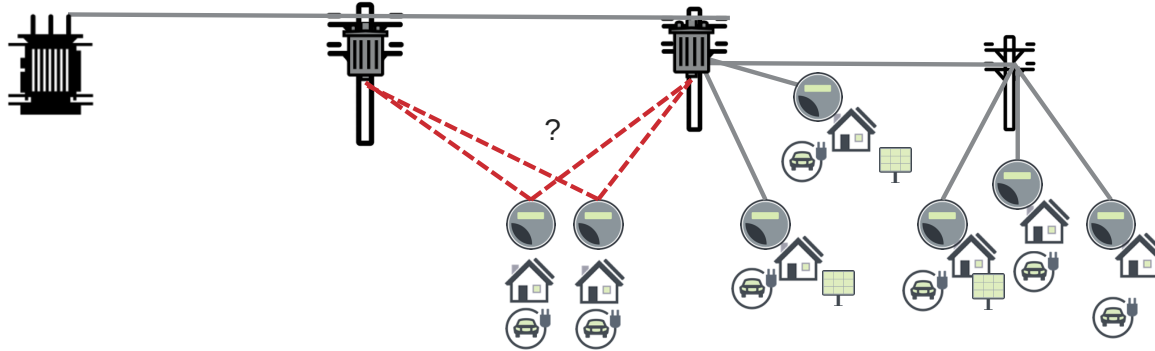


Bypass conductors installed



Brand new, expertly installed meter bypass

Location Awareness



Distribution Operations/GIS

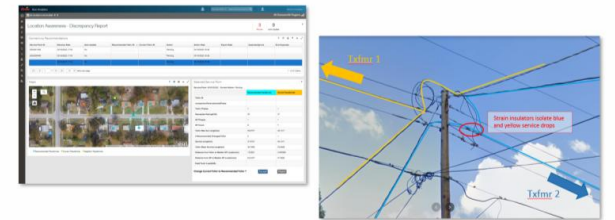
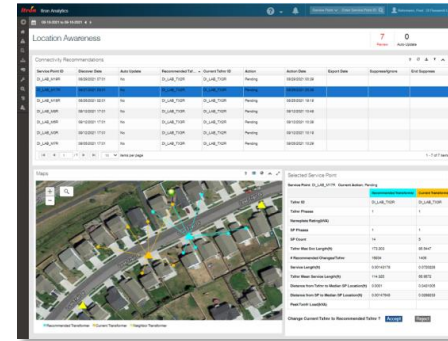
You are responsible for an accurate model, necessary for outage management, reliability reporting, power flow models, and for EV/PV hosting. You need a tool to cost-effectively validate your connectivity model and notify you of changes.

Location Awareness

Production



- » **Function:** Determines connectivity of meter to transformers, phases, and feeders utilizing PLC and RF peer-to-peer
- » **Benefits:** Maintain up-to-date grid topology awareness for DI and back-office utility systems, including:
 - Advanced transformer management
 - Storm simulation & outage detection & response
 - DER analytics and management
 - Accurate asset loading and planning, including phase balancing and load studies
- » **Outputs:**
 - Discrepancy and recommended corrects list in .csv or through API
 - API for other system integration (e.g. other apps)



Location Awareness

Production

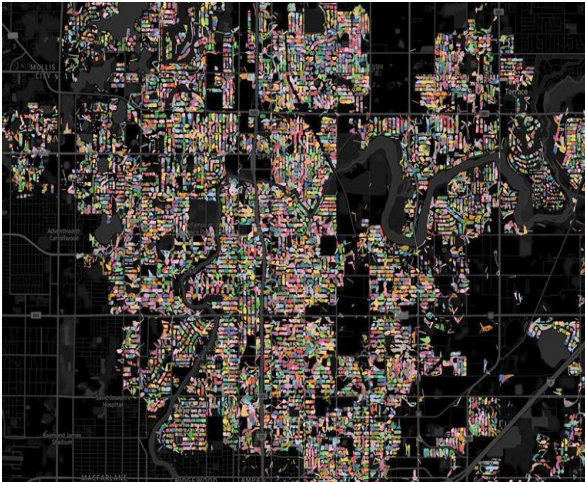
- Currently deployed at Tampa Electric Company (TECO)
 - Meter to Transformer (M2T)
 - 329,000 meters
 - Identified 8,519 Discrepancies (01/03/2023)
 - Field Validated ~150 Meter Discrepancies
 - 99% Accuracy
 - Meter to Phase (M2P)
 - 40,000 meters
 - Field Validated ~187 Meters (01/26/2023)
 - 97% Accuracy
 - Transformer/Meter to Feeder/Bank (M2F)
 - 40,000 meters
 - Initial results show ~90% Accuracy
 - Subsequent algorithm refinements and testing are underway



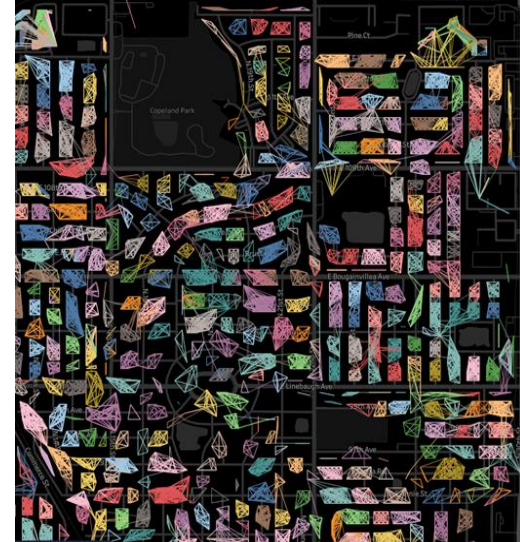
Location Awareness (LA) - M2T	3-Jan	
	Count	Percentage
M2T Accuracy (Precision)		99.3%
Total Meters with M2T Data (DS Database)	329,844	
Total M2T Discrepancies	8519	3%
Manually Validated	149	2%
Projected Accurate M2T SPs	327,614	99.3%

Location Awareness (LA) - M2P	26-Jan	
	Count	Percentage
M2P Accuracy (Precision)		97%
Total Meters with M2P Data (Approx)	40,000	
Manually Validated	187	0.5%
Projected Total Accurate M2P SPs	38,717	97%

Location Awareness – Meter-to-Transformer

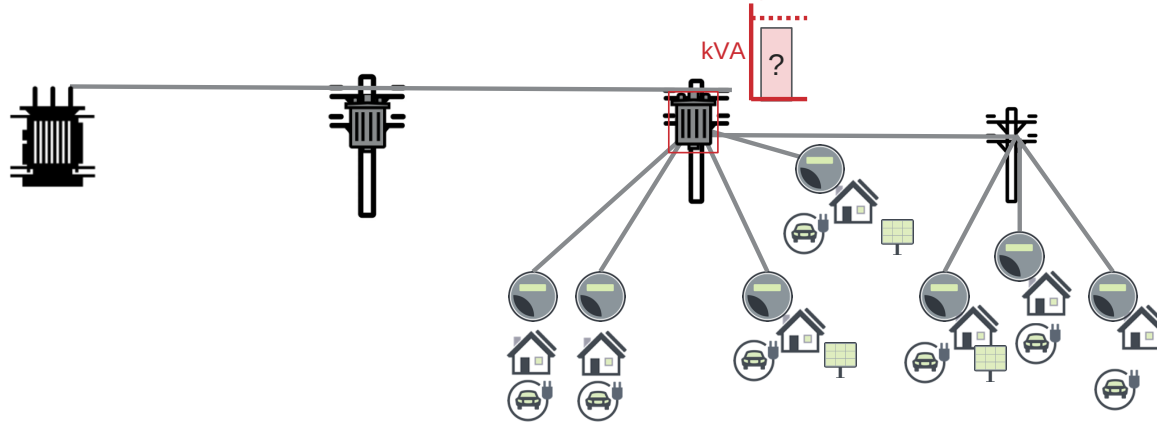


Visualization of groupings



Visualization of groupings - closeup

Advanced Transformer Load Monitoring



Distribution Operations

You want to prevent transformer overloading – especially transformer failure or fuse operation (e.g., 200% overload). However, you can't take real-time actions without knowing the real-time loading.

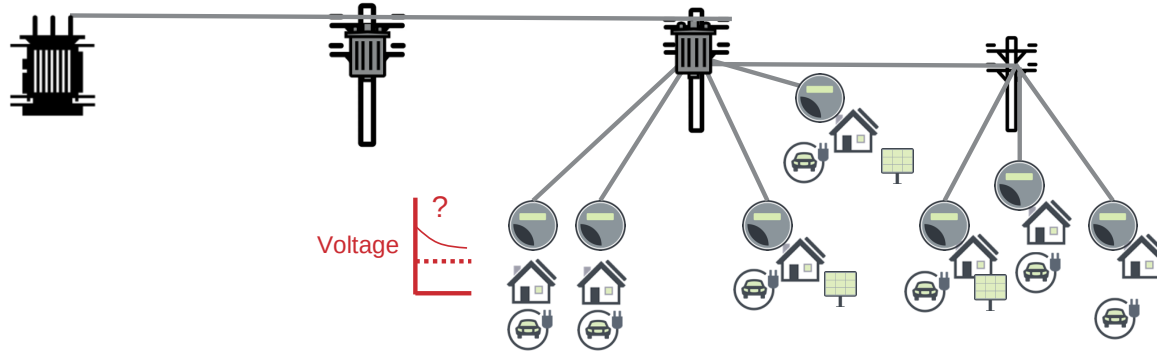
Advanced Transformer Load Monitoring

Prototype



- » **Function:** Near real-time monitoring of distribution transformer load statistics (e.g. overload, power factor, reverse power flow)
- » **Benefits:**
 - Preserve transformer lifetime
 - Reduce unplanned outages
 - Reduced network traffic through use of spokesmeters
 - More effective programs (e.g. VVO/CVR) or better resolution control (e.g. load flow)
- » **Outputs:**
 - Configurable output of transformer load statistics through API or through Itron UI
 - Integration with control systems through API at configurable intervals (e.g. 5-minute) and the ability to report by exception.

Advanced Transformer Voltage Monitoring



Distribution Operations

You are running a Conservative Voltage Reduction (CVR) program, lowering voltage during times of high usage. However, you do not have real-time visibility at all premises to ensure the voltage doesn't become **too** low.

Advanced Transformer Voltage Monitoring

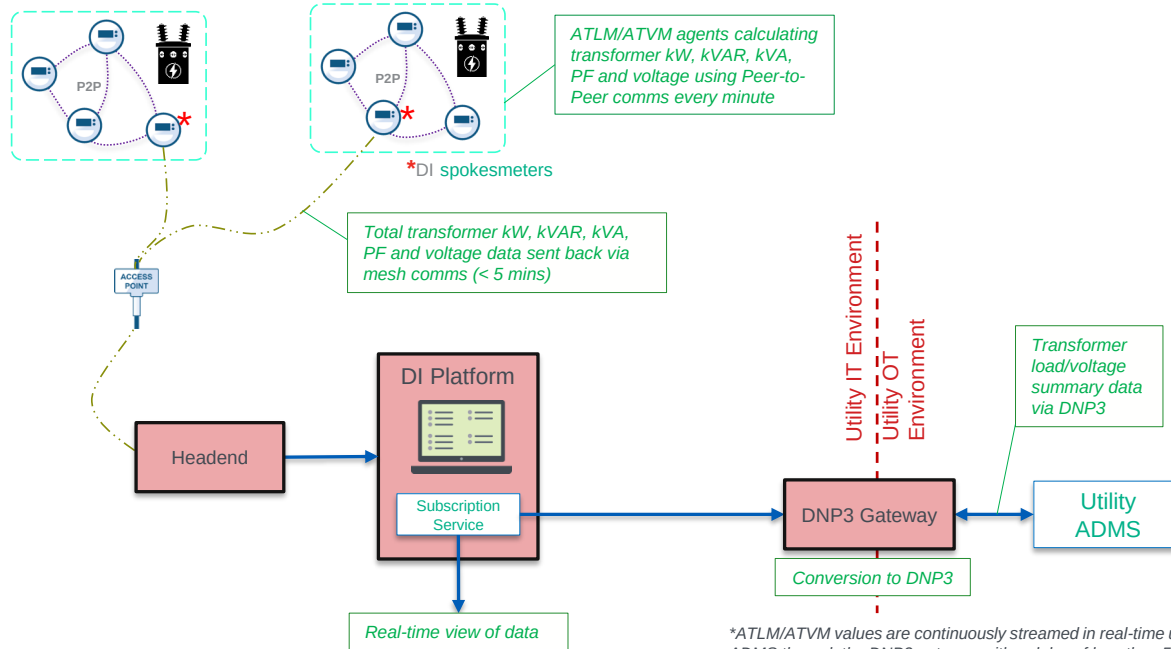
Prototype



- » **Function:** Near real-time monitoring of voltage statistics for service points connected to a distribution transformer
- » **Benefits:**
 - Accurate voltages at endpoints for worst-case planning models
 - Reduced network traffic through use of spokesmeters
 - More effective programs (e.g. VVO/CVR) or better resolution control (e.g. load flow)
- » **Outputs:**
 - Configurable output of transformer voltage statistics through API or through Itron UI
 - Integration with control systems through API at configurable intervals (e.g. 5-minute)

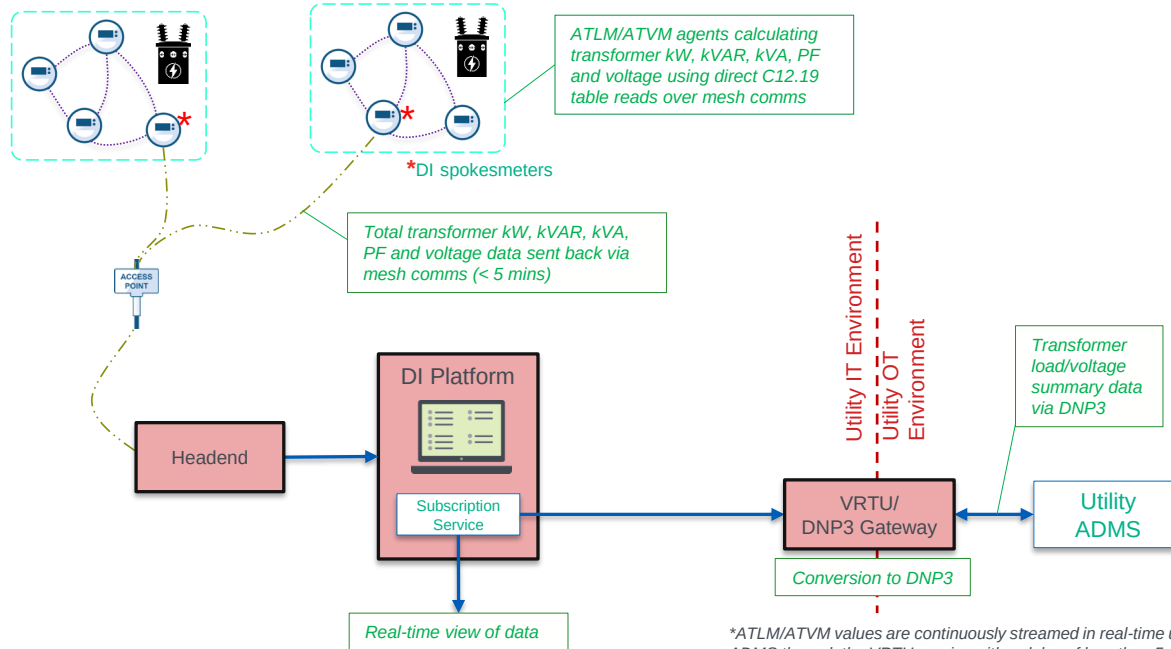
Greenfield ATLM/ATVM Data Flow

DI capability enables real-time distribution transformer monitoring capabilities

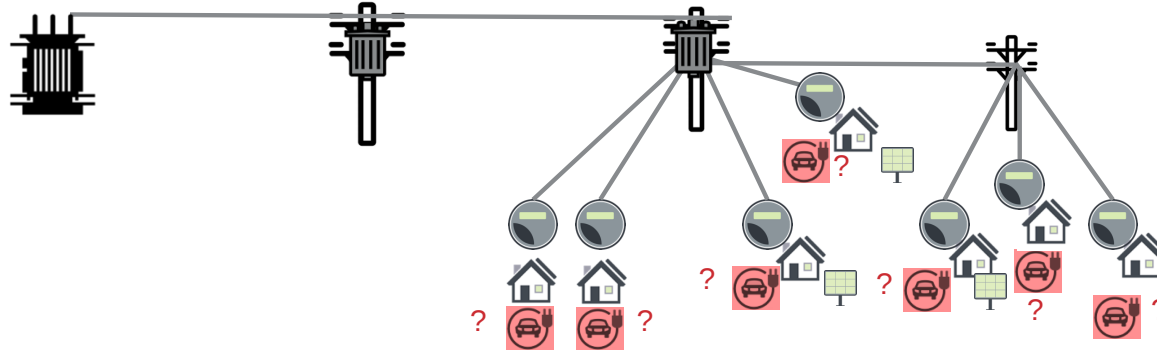


Brownfield ATLM/ATVM Data Flow

DI capability enables real-time distribution transformer monitoring capabilities



EV Awareness



Distribution Operations, Distribution & Strategic Planning

You want to know what your real-time large controllable and uncontrollable EV loads are, down to a transformer level. It would be great to feed this information automatically into a DERMS or other control system to avoid overloading.

EV Awareness

Prototype



» **Function:** Provides near-real-time (e.g. 5-minute timestep) disaggregation information for when an electric vehicle begins or stops charging

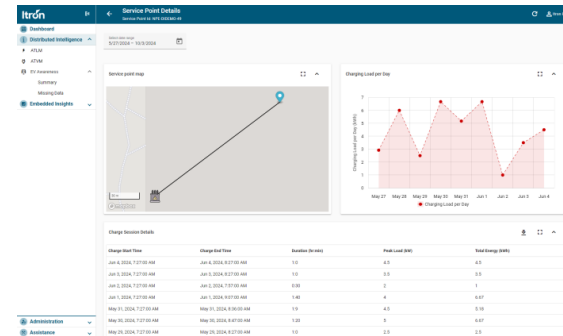
» Benefits:

- EV models for 'offline' applications such as in utility planning and EV program customer engagements
- Inputs for real-time controls (e.g. DERMS, ADMS) for applications such as distribution transformer protection and Volt/Var Optimization

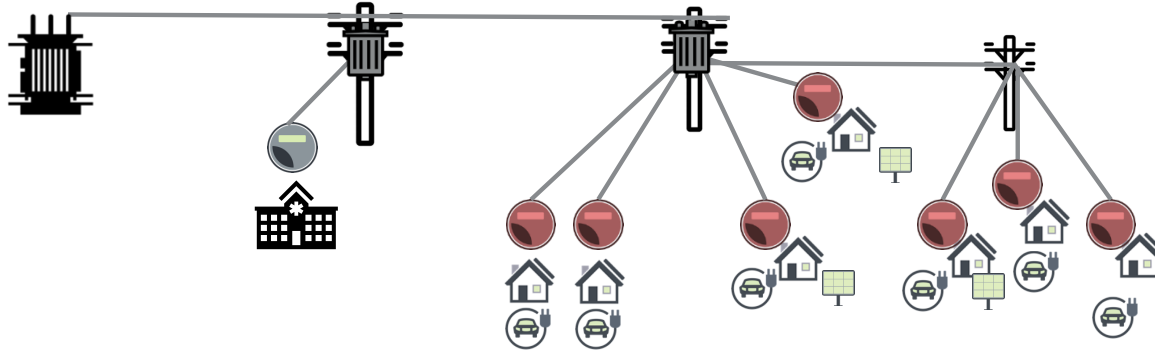
» Outputs:

- Alarms through API containing peak kW charging and kWh for sessions

Service Point ID	Taxlot ID	EVSE detected (last 30 days)	Most recent EVSE charging	Average charging/day	Average EVSE energy/day (kWh)	Peak EVSE Load (kW)	EV Count (last 30 days)	EV registered	Date EV Detected
NPS-00000001	TX_LJA-0000	No	Sep 25, 2022, 2:37:28 PM	1.2	1.2	1.9	0	No	Sep 25, 2022, 2:32:19 PM
NPS-00000048	TX_LJA-0000	No	Sep 27, 2022, 6:31:01 PM	10.6	4.58	1.9	0	No	Sep 28, 2022, 1:51:28 PM
NPS-00000051	SPHAR-0001	No	May 25, 2022, 9:28:55 PM	2	1	7	0	No	May 25, 2022, 9:28:57 PM
NPS-00000053	SPHAR-0001	No	Aug 31, 2022, 4:41:59 PM	1	0.18	7	0	No	Aug 31, 2022, 4:41:59 PM
NPS-00000058	No	No	Sep 25, 2022, 4:40:36 PM	3	0.07	1.9	0	No	Sep 25, 2022, 4:40:36 PM



Advanced Premise Load Shedding

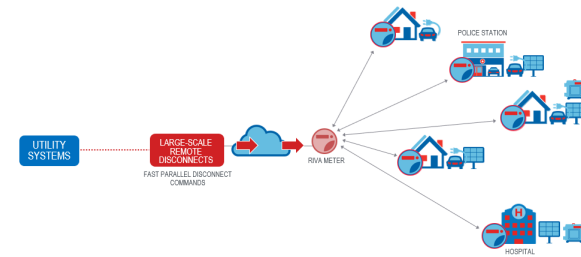
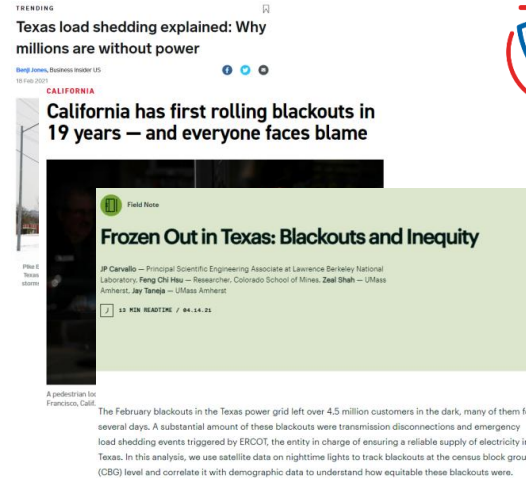


Distribution System Operations

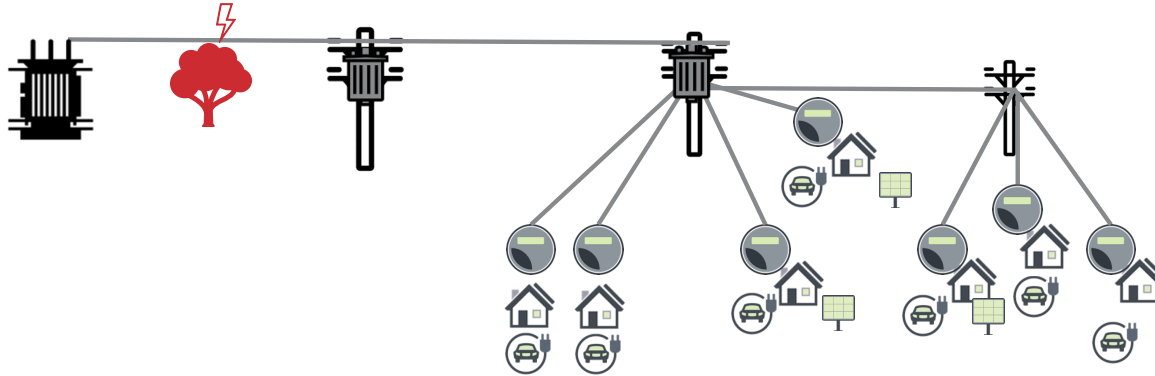
Due to resource constraints (e.g., loss of unit, extreme weather), you want to avoid automatic load shedding or worse. You need to prepare to shed load to save portions of the system, but need a fast, reliable, and flexible way to do this securely.

Advanced Premise Load Shedding Developing

- » **Function:** Load shed on individual targeted meters quickly (e.g. in less than a minute) that meets utility scale, security, and equity requirements
- » **Benefits:**
 - **Optimal** load shedding with granularity and maximizing load available for shedding
 - **Equitable** load shedding by enabling non-critical loads near critical loads to be shed
- » **Outputs:**
 - Confirmation of disconnect/reconnect events in separate UI or existing control system
 - API for other system integration (e.g. other apps)



Waveform Anomaly Detection

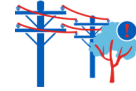


Distribution Operations

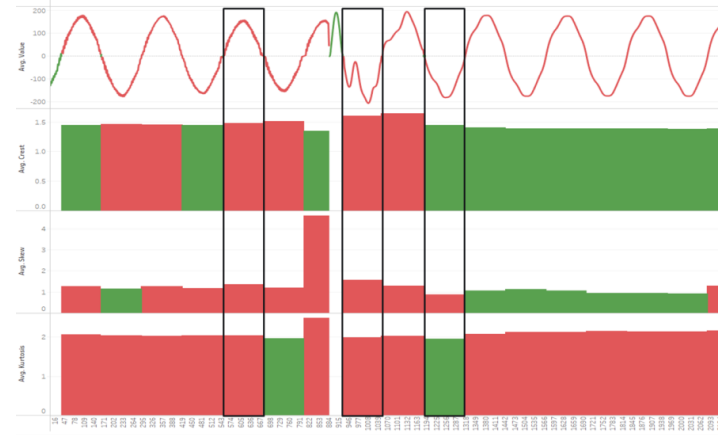
You are in an area that has a high risk of wildfire. You want to be notified when there's a potential fire hazard as a result of vegetation or wildlife contact, so you can immediately act.

Waveform Anomaly Detection

Prototype

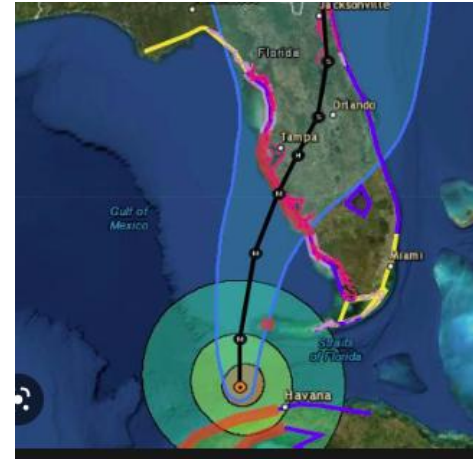
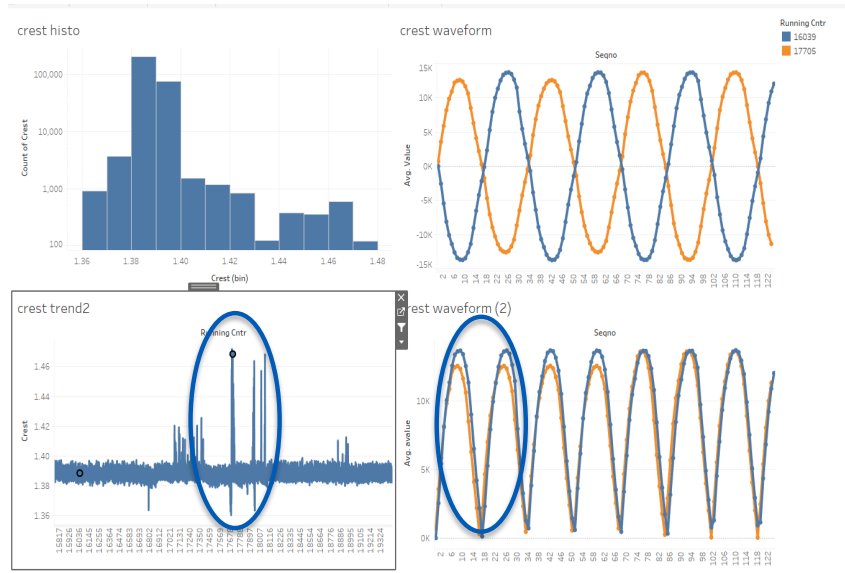


- » **Function:** Detect grid anomalies using DI meter data processing along with identification of root cause of grid anomalies
- » **Benefits:**
 - Detect wide variety of anomalies using high-fidelity waveform data from a greater density of meters across the grid
 - Example grid anomalies include vegetation contacts, wildfires, protection device failures, grid equipment issues, power quality issues
- » **Outputs:**
 - Alarms and events presented through API or through Itron UI



Example 1: Hurricane Ian Voltage Anomaly Event

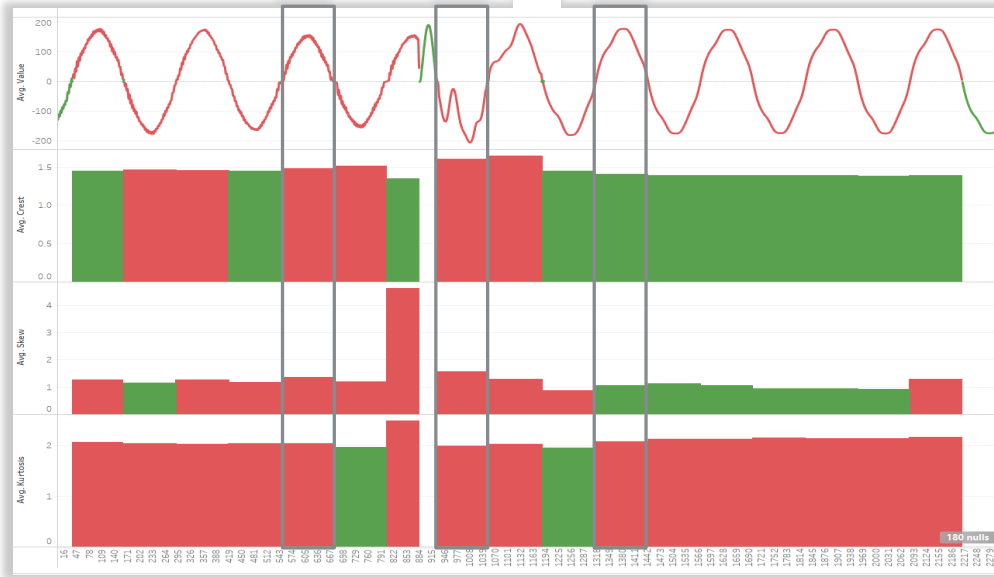
Detecting grid events using high-fidelity data



Tuesday 10/27/2022
Florida Keys Impact
(>100 miles away from Marco)

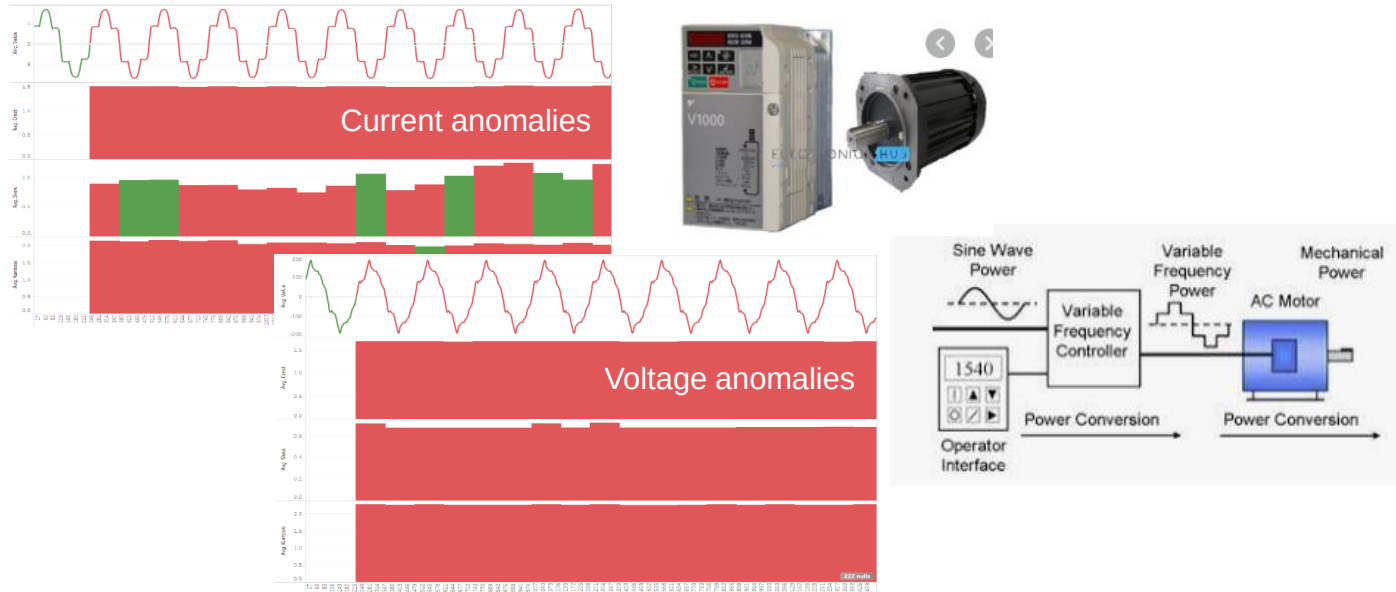
Example 2: Capacitor Bank Switching Triggered Harmonics

Detecting grid events and equipment health using high-fidelity data

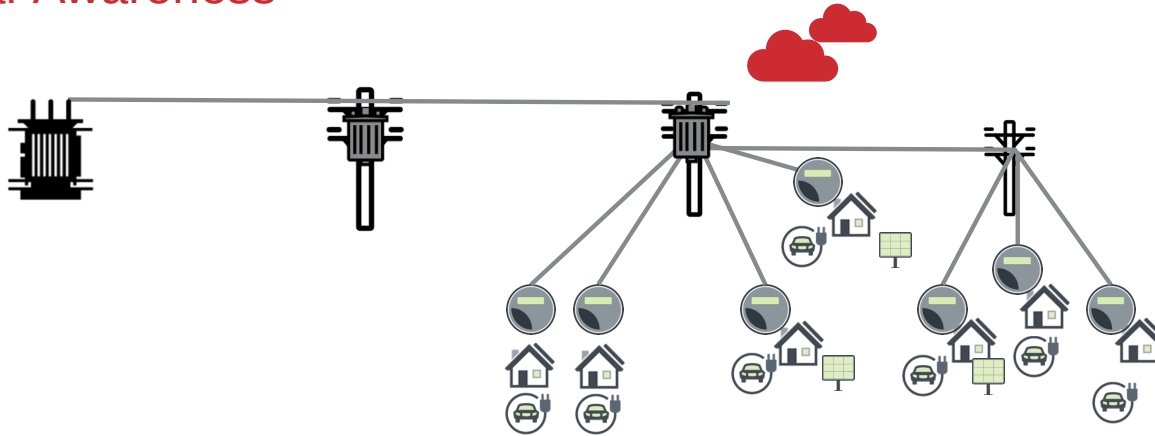


Example 3: Power Quality Issues Induced by Large VFDs

Detecting power quality issues using high-fidelity data



Solar Awareness

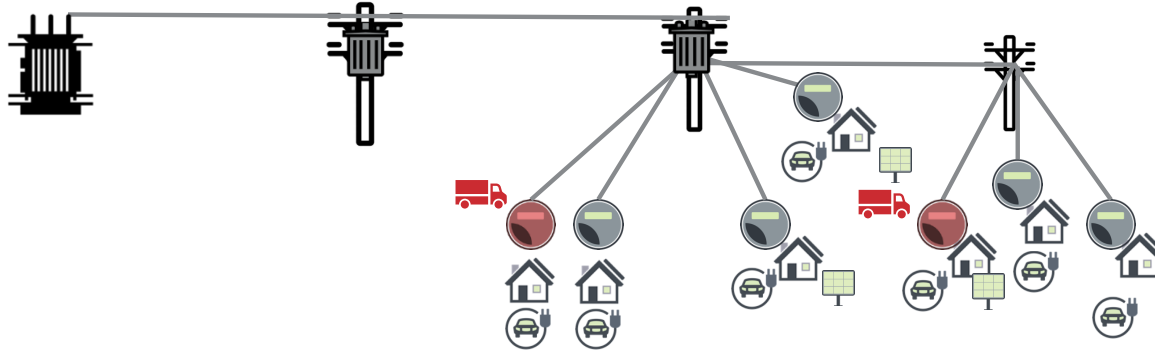


Distribution Operations

Unforecasted cloud cover is approaching, and you want to know how much solar generation you will lose, as this needs to be worked into real-time control schemes to prevent transformer overloading.

- [illegible]

Voltage Insights



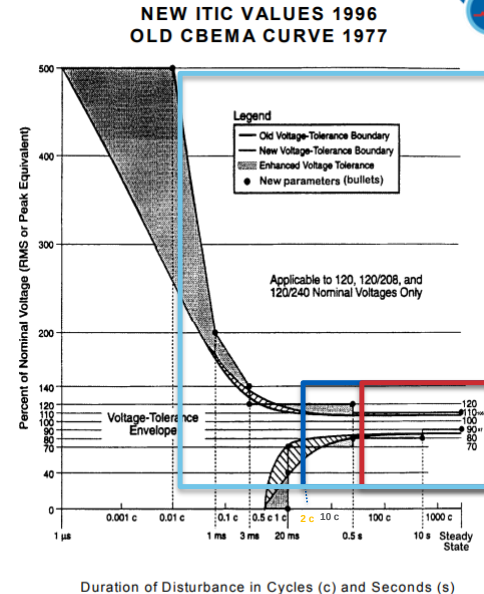
Distribution Operations

Your group receives several complaints a month where you have to roll a truck to install a power quality meter, hoping to catch the power quality issues that they were complaining about. You wish you didn't have to roll trucks so much.

Voltage Insights

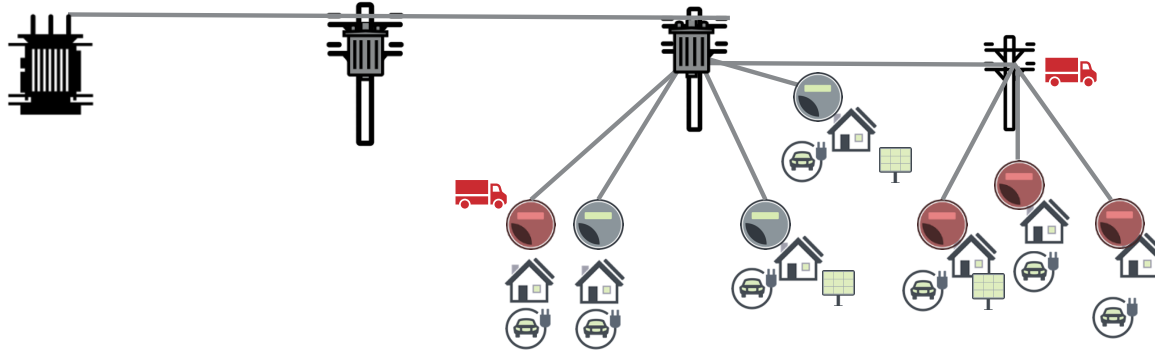
Developing

- » **Function:** Provides CBEMA/ITIC curve voltage tracking and IEEE 519 harmonics data at a premise
- » **Benefits:**
 - Reactionary benefits – Better insight and less hours spent to diagnose a problem
 - Proactive benefits – Avoids customer complaints and unplanned outages
- » **Outputs:**
 - Voltage deviation data, compared to ANSI C84.1/CBEMA/ITIC reference
 - Harmonics data



Footnote: ITIC = Information Technology Industrial Council
CBEMA = Computer and Business Electronic Manufacturers Association
ANSI Steady State values are plus 6% to minus 13% measured at end-use equipment

Advanced Outage Awareness



Distribution Operations

Your group receives several complaints a month where you have to roll a truck to install a power quality meter, hoping to catch the power quality issues that they were complaining about. You wish you didn't have to roll trucks so much.



Advanced Outage Awareness

- » **Function:** Provides power outage indication and scope, as well as associated accuracy estimate (confidence factor)
- » **Benefits:**
 - Enhanced Outage detection accuracy
 - Faster restoration through improved scope identification
 - Operational cost reduction
- » **Output Reports:**
 - Outage
 - Restoration
 - Nested Outage

Itron's Distributed Intelligence Roadmap

North America

HW4.1+ mixed w/ HW4.0

HW4.1+

HW4.1+ GenX

HW4.2+



Existing Apps	2025	2026+
Deployed in-field (scaled or pilot)	Under Development / Committed	Strategic Initiatives / Directional
• Advanced Temperature Monitoring • High Impedance Detection • Meter Bypass Detection • Voltage Bellwether (ACT only) • EV (Electric Vehicle) Awareness • Location Awareness – meter to transformer + Phase-ID + Feeder mapping • Advanced Transformer Voltage Monitoring • Advanced Transformer Load Monitoring • 2030.5 meter read	• Solar Awareness • Virtual RTU – DNP3 Interface to ADMS • Voltage Insights • Advanced Outage Awareness • Brownfield Advanced Transformer Load & Voltage Monitoring • EVSE Management • Waveform Anomaly Detection	• Advanced Transformer Load Management • Secondary Theft Detection • IEEE 2030.5 – battery/inverter control • Energized Downed Conductor/Open Conductor • Vegetation Contact Detection • Power Quality • Advanced Premise Load Shedding • Under Frequency Load Shedding • Cold Load Pickup • MV Fault Location • MV Asset Predictive Maintenance • MV Voltage Management (*via partner devices)



Thank You



Proven Benefits 2025

Market Intelligence & Business Value Analysis

Proven Benefits

Asset Management with Advanced Metering Infrastructure

Enhancing Customer Safety with Distributed Intelligence



Description

- » CenterPoint Energy (CNP) serves approximately 2.8 million metered electricity and 4.2 M gas customers in 6 states. CNP leveraged their 150k OW Riva Network in Indiana to pilot DI
- » DI has already demonstrated multiple benefits:
 - » Planned vs. reactive truck rolls
 - » Minimized equipment damage
 - » Conversion of O&M to CAPEX
 - » Reduced CSR minutes; Improved customer satisfaction
 - » Improved customer reliability metrics
 - » Avoided PUC escalations



Meter overheated due to socket problem

High Impedance Detection Benefits reported

95%

Accurate

200+

Field Visits

99%

Proactive

Active Temperature Monitoring Benefits reported

80%

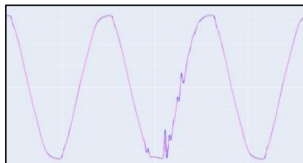
Accurate



Predict and Mitigate Wildfire Risk

Description

- » More than 50% of PG&E's service territory is now classified as high fire-risk areas.
- » PG&E has started a DI pilot deployment of Itron Riva meters, which are fully backwards compatible with the existing Itron GenX network infrastructure
- » PG&E has piloted three DI Apps: Location Awareness, High Impedance Detection, and Anomaly Detection.
- » 1.6 million meter events were observed, helping with:
 - » Early detection of overhead conductor failures and vegetation contacts
 - » Meter to transformer mapping and phase identification
 - » Reduced wildfire risk and improved grid reliability



Example of a waveform anomaly event identified by multiple meters during the pilot

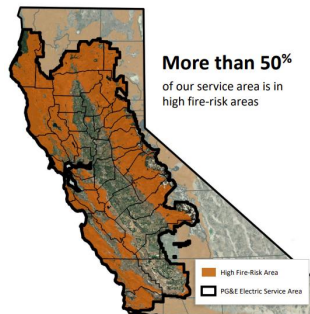
Initial Benefits

10k

Grid Events Detected

1%

Of Service Points identified for maintenance



High Impedance Detection in the Distribution Grid



Description

- » Xcel Energy, which serves more than 3.7 million metered electricity and 2.1 million gas customers across 8 states, is deploying the High Impedance Detection (HID) app
- » During testing Xcel recognized that, since the electricity meter is at Point of Common Coupling (PCC), the HID app can be used to look toward the customer (Customer-Facing), toward the system (Grid-Facing) or examine the meter itself (Meter-Centric)
- » In one example, a field investigation, triggered by an HID Alarm, found no problems with the meter, socket or wires. Further inspection, however, revealed a damaged overhead line covered by dense foliage, approximately 60 feet from the home

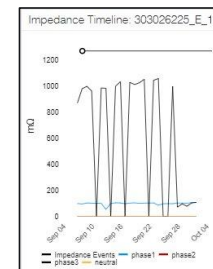
Results

Operational Benefits

Decreasing customer outages and complaints through proactive resolution, also limiting safety concerns

Planning Benefits

Identify Patterns for Capital Project justification



After repair, the Impedance metric returned to expected values and the voltage anomaly has been addressed.

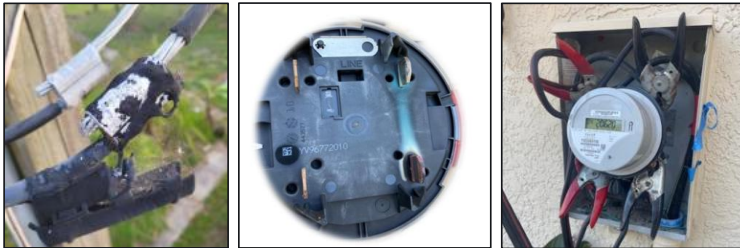
Source: [Xcel Energy Itron Inspire 2024](#)

Enhancing Customer Safety



Description

- » Tampa Electric serves more than 830k customers. TECO is making a transformational investment in new customer experience and operational programs
- » TECO has deployed the HID and High Temperature Apps in more than 95% of its meter population



Itron's DI allows TECO to find map issues related to (from left to right): High Impedance, High temperature and Bypass Theft

Results

90%

Precision identifying High Impedance

95%

Precision identifying High Temperature

44%

*Precision identifying Meter Bypass**

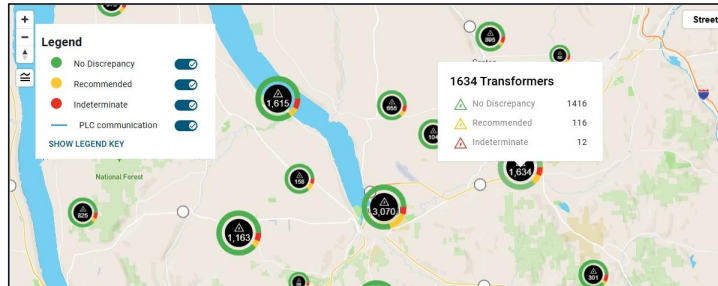
** Initial precision was 90%+, however TECO requested more cases to be flagged for field investigation due to low truck roll costs and high average theft found per instance*

Demonstrated Performance of Location Awareness



Description

- » Tampa Electric serves more than 830k customers. TECO is making a transformational investment in new customer experience and operational programs
- » Itron's DI Location Awareness application was validated at TECO to automatically detect meter-to-transformer, meter-to-phase, and transformer-to-feeder/substation bank connections, ensuring accurate grid topology and rapid response to changes.



Results

98.9%

M2T accuracy within 24 hours

98.7%

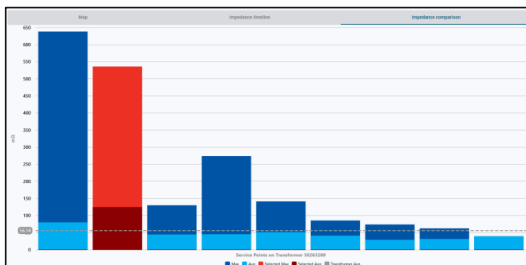
M2P accuracy within 24 hours

Immediate DI Results During AMI Roll-out



Description

- » LUMA Energy operates Puerto Rico's transmission & distribution system (since 2021) within an inherited grid marked by aging equipment, vegetation risks, storm exposure and funding constraints.
- » Instead of waiting for the full AMI roll out to be completed first, LUMA immediately started installing the High Impedance Detection (HID) DI App in the San Juan Sector with an initial 50k meters.



DI Dashboard with several meters indicating high impedance (200 milliamps+) on one single transformer

Initial Results¹

100%

Success Rate

1.5%

Of HID deployed apps triggered an alarm

50%

Of HID issues indicate multi premise unplanned outage risk

"Installing smart meters is a fundamental step in our commitment to modernize Puerto Rico's energy infrastructure. This technology optimizes consumption, improves efficiency, and empowers our citizens to make informed energy decisions. Together, we move toward a more sustainable and transparent future,"

Juan Rodríguez, SVP of Capital Programs at LUMA.

Thank You



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REDACTED (CONFIDENTIAL INFORMATION REMOVED)

CI C0068719 IR-2 Confidential Attachment 5 has been removed due to confidentiality.

REDACTED (CONFIDENTIAL INFORMATION REMOVED)

CI C0068719 IR-2 Confidential Attachment 6 has been removed due to confidentiality.

REDACTED (CONFIDENTIAL INFORMATION REMOVED)

CI C0068719 IR-2 Confidential Attachment 7 has been removed due to confidentiality.

REDACTED (CONFIDENTIAL INFORMATION REMOVED)

**CI C0068719 IR-2 Confidential Attachment 8 has been
removed due to confidentiality.**

REDACTED (CONFIDENTIAL INFORMATION REMOVED)

CI C0068719 IR-2 Confidential Attachment 9 has been removed due to confidentiality.

NON-CONFIDENTIAL

Request IR-3:

Please describe why existing Advanced Metering Infrastructure (AMI) and related distribution automation systems cannot meet the same needs.

(a) Please explain whether the AMI metering system is required to implement the DI Apps.

(b) Please explain whether any other meter types or field equipment are required for the DI Apps.

(i) If no new field hardware is required, please explain how the DI Apps will impact existing metering assets.

(c) Please describe the current functionality and capabilities of the AMI system.

(d) Please provide the number and percentage of AMI meters that are installed.

(e) Please explain the number and percentage of customers who have opted in, or opted out, for AMI meter functionality.

(f) Please explain whether opt-in and opt-out participation affects the meters to support the proposed DI Apps, and the potential effects of pilot project results, costs and customer benefits.

(g) Please explain whether customers opted out of AMI meter functionality would be included in the proposed DI Apps.

(i) If yes, please explain why.

NON-CONFIDENTIAL

1 Response IR-3:

2
3 Please refer to IR-1, part (a).

4
5 (a) Yes. DI Apps use the functionality embedded within compatible Itron infrastructure, rather
6 than requiring deployment of a separate field technology monitoring platform.
7 Accordingly, DI Apps is dependant on NS Power's AMI meters, communications network,
8 and head-end system.

9
10 (b) No additional meter types or field equipment are required for this project.

11 (i) NS Power's AMI meters (Itron Openway Riva) are manufactured with the
12 capability to host and operate DI Apps independently of meter metrology functions.
13 The use of DI App functionality is governed by Measurement Canada's Notice of
14 Approval for the meter and its associated firmware.

15
16 (c) The AMI system supports core meter-to-cash functionality such as meter reading and
17 billing. In addition, the AMI system provides the following capabilities:

- 18
- 19 • **AMI Field Network Management:** Allows support staff to monitor AMI network
20 performance and meter connections to address communication issues identified
21 with field devices or meters.
 - 22 • **Meter Event & Status Data to NS Power:** Provides data related to the state of
23 power flow and meter functionality occurring at the meter. This allows support staff
24 to be notified of abnormal conditions that require attention and can also be used to
25 support the analysis of power flow on the grid and in troubleshooting power quality
26 concerns reported at the premise.
 - 27 • **Firmware Deployment:** Smart meters use firmware installed on the meter to
28 manage various technical aspects of meter functionality. The AMI meter vendor
29 regularly releases new firmware to improve the performance of meters or to address
30 an identified defect.
-

NON-CONFIDENTIAL

- **Meter Pinging:** Allows support staff to ping a meter to verify if it is connected to the grid. This is often used in outage response to validate if a meter is on or off.
- **Over-the-Air Configuration Changes:** Allows a meter's basic configuration to be changed over the air. An example would be changing a meter from the default configuration to a bi-directional configuration for a customer that has installed a net metering solution (ex., solar panels).
- **Remote Connect / Disconnect:** Allows a meter to be turned on or off remotely from the headend system rather than needing to be done at the meter in the field.
- **Field Data Retrieval:** Some data elements (ex., meter log files) can only be retrieved from the meter in the field. The field tools are authenticated against the headend system as part of its security set-up.

(d) NS Power has installed 544, 911 AMI meters as of September 4, 2026, representing 96.3 percent of all installed meters.

(e) As of September 4, 2026, NS Power has 18,120 customers who have opted out.

(f) DI Apps will not be deployed at opt-out customer premises because AMI communications are required to enable the functionality of DI Apps. However, many of the anticipated benefits of DI Apps relate to improved visibility, planning, and operation of the broader distribution system and as such would not necessarily be limited to customers with DI Apps deployed on their premises. Information provided by DI Apps installed elsewhere on the distribution system can help NS Power improve locational awareness, outage detection and restoration activities, identify emerging meter asset and safety issues, optimize system planning and asset management decisions, and support more efficient operation of distribution feeders. The associated benefits, such as improved reliability, service quality, and overall system performance would not be limited to customers with DI Apps installed.

NON-CONFIDENTIAL

1 For DI Apps that utilize peer-to-peer communication and local data aggregation, this
2 project will assess the impact of unavailable meters (including opt-out) on DI App results
3 as part of the evaluation.
4

5 (g) No. Non-AMI meters do not support DI Apps and AMI meters installed at opt-out customer
6 premises with radio frequency and power line carrier communications disabled will not be
7 included in this project because DI Apps is dependent, in part, on the AMI communications
8 network which is not enabled for opt-out customers. However, as noted above in part (f),
9 potential benefits associated with DI Apps are not necessarily limited to customers with DI
10 Apps deployed on their meters.

NON-CONFIDENTIAL

Request IR-4:

Please explain whether the combination of AMI devices and other distribution devices with communication functions, such as existing distribution breakers, existing distribution Potential Transformers and Current Transformers, reclosers, sectionalizers, and other distribution control devices, can provide the same functionality without the DI Apps.

(a) If no, please explain why.

Response IR-4:

While in some instances, NS Power can achieve similar function through existing alternatives, the level of grid-edge functionality and near real-time analytics being evaluated by this project are not available through existing NS Power AMI and distribution devices.

NS Power's distribution system currently utilizes a range of monitoring, protection, automation, planning, and operational technologies, including Advanced Metering Infrastructure (AMI), breakers, reclosers, instrument transformers, SCADA, ADMS, GIS, and operational processes. While these systems provide important operational information and remain foundational components of the Company's distribution system, they do not provide the same functionalities as DI Apps.

The purpose of this project is not to evaluate whether DI Apps should replace these existing systems. Rather, the project is intended to evaluate whether improved operational decision making can be achieved by leveraging the distributed intelligence capabilities embedded within NS Power's existing Itron OpenWay Riva AMI platform. The Project will assess whether these grid-edge analytics can provide additional operational insights beyond those available through existing systems and processes.

NON-CONFIDENTIAL

1 (a) The existing AMI system does not support the storage or transmission of the high-
2 resolution data required to provide the insights offered by DI Apps.

3
4 Many of the proposed DI Apps are designed to rely on the high-quality, high-resolution
5 data already being measured by AMI meters. Replicating the capabilities provided by DI
6 Apps using separate field devices would generally require the installation of additional
7 monitoring and communications technology at customer premises.

8
9 Additional details, including the technical function of each proposed DI App and why the
10 same functionality cannot be provided by existing alternatives or improved processes and
11 why not, is provided in IR-13 Attachment 1. In instances where similar functionality can
12 be provided by existing alternatives, explanations are provided as to how DI Apps are
13 expected to build on existing functionalities and processes, reducing manual requirements,
14 improving efficiency and reducing timelines.

NON-CONFIDENTIAL

Request IR-5:

In “Description,” NS Power noted that:

The DI Apps project will consist of deploying a cloud-based Itron DI App platform on existing meter and head-end infrastructure and piloting a set of apps across targeted groups of meters.

(a) Please explain who can access the installed apps and the data collected by these apps.

(b) Please identify where these data will be stored.

(c) Please explain whether any review of cybersecurity risk and privacy impact, has been completed for the project, and identify any potential risks and mitigation measures.

Response IR-5:

(a) Access to the AMI headend system and the Distributed Intelligence (DI) cloud platform and applications is restricted to authorized NS Power users based on their operational responsibilities, such as Smart Meter Operations, Operational Technology, IT, and distribution control centre, engineering and planning.

The data from the DI Apps will be delivered to the DI platform where it may be accessed by the users mentioned above or subsequently delivered to other systems through integrations where access is limited to individuals with a valid business need.

(b) The data from the DI Apps will be hosted on the Itron DI App cloud platform.

Data generated by the pilot may also be transferred to and stored within existing NS Power systems such as GIS to support pilot evaluation activities, reporting, or operational use

NON-CONFIDENTIAL

1 cases. Data protection measures will be applied to DI App data in accordance with NS
2 Power Cybersecurity Standards.

3
4 (c) A vendor Cybersecurity Risk Assessment has been completed. A Cybersecurity Risk
5 Assessment on the DI App solution is in progress and will be completed prior to
6 enablement of DI Apps.

7
8 Cybersecurity and privacy considerations being evaluated through the Risk Assessment
9 include:

- 10
11 • Assessment of DI App data to determine if personally identifiable information is
12 used in the solution. Execution of Privacy Impact assessment if required.
- 13 • Protection of data exchanged between AMI infrastructure, cloud platforms, and
14 enterprise systems.
- 15 • Completion of a Privacy Impact Assessment as needed.
- 16 • Access control and authentication requirements for authorized users.
- 17 • Protection of cloud-hosted services and supporting infrastructure.
- 18 • Vendor access management and third-party connectivity controls.
- 19 • Secure system integration and data transfer mechanisms.
- 20 • Compliance with applicable NS Power cybersecurity, privacy, and governance
21 requirements.

22
23 Potential mitigation measures for the considerations being evaluated through the Risk
24 Assessment include:

- 25
26 • Apply appropriate data classification and protection controls; for example, use of
27 secure communications, authentication, and encrypted data-transfer mechanisms.
- 28 • Completion of cybersecurity review and approval processes prior to
29 implementation.

NON-CONFIDENTIAL

- 1 • Application of NS Power access-control, identity-management, and security
- 2 governance requirements.
- 3 • Controlled vendor-access processes and contractual security obligations.
- 4 • Ongoing security monitoring, architecture review, and governance oversight
- 5 throughout project implementation and operation.

NON-CONFIDENTIAL

Request IR-6:

In “Description,” NS Power noted that:

This project will install apps which are intended to support:

- **grid model accuracy and connectivity validation,**
- **safety related signal detection, and**
- **distribution grid situational awareness.**

(a) Please describe the technical function of the proposed DI Apps, and describe the data used by each app.

(b) Please describe the existing distribution equipment required for implementing the DI Apps,

(c) Please explain how the DI Apps will improve the grid criteria above.

Response IR-6:

(a) Please refer to IR-13 Attachment 1.

(b) DI Apps are compatible with, and will be deployed through, NS Power’s AMI Infrastructure. They do not require other existing distribution devices to be deployed.

(c) DI Apps enhance visibility into distribution system conditions by leveraging grid-edge computing and analytics capabilities available through NS Power’s existing AMI infrastructure. As stated in the Description, the proposed DI Apps are intended to support one or more of the following: grid model accuracy and connectivity validation, safety related signal detection and grid situational awareness [emphasis added]. However, NS Power cannot confirm that DI Apps will result in improvements in any or all of these areas until these technologies are tested within NS Power’s specific operating system. A primary

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1 objective of the pilot is to evaluate the functionality and operational value of the DI Apps
2 within NS Power's system and assess their ability to create improvements in the areas
3 described above, and to determine whether these improvements are sufficient to justify
4 broader deployment. Please refer to IR-13 Attachment 1 which sets out the areas of
5 improvement that each DI App is intended to support.

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Request IR-7:

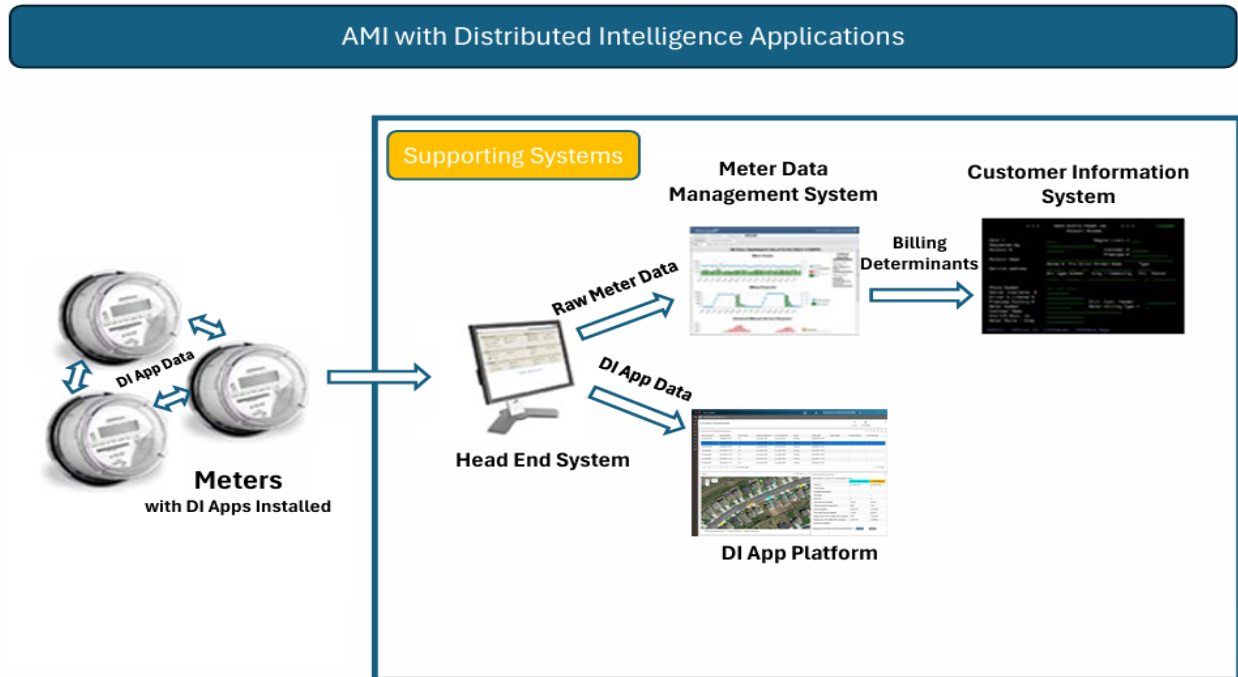
Please explain how the DI Apps operate under NS Power's existing AMI environment, such as how information is transferred between meters, head-end systems, communications networks, and cloud platforms.

Response IR-7:

DI Apps are deployed on AMI meters where they collect and analyze high-resolution data. Some DI Apps require the AMI meter to communicate with other nearby meters using the AMI network's power line carrier (PLC) and radio frequency (RF) mesh communications capabilities. Data on the meter, and in transit, is protected using existing AMI security architecture. Data is communicated to the AMI head-end system through the existing AMI communications network. This project will integrate the AMI head-end system with the Itron DI Platform, which will reside within the same cloud environment hosted by Itron. There, data from DI Apps will be further analyzed and can be accessed by authorized NS Power users through application-specific views. Please also refer to the Figure below.

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1 **Figure 1: AMI with Distribution Intelligence Applications**



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Request IR-8:

Please describe how the DI Apps will be deployed, including whether:

- (a) the apps will be deployed in existing AMI meters;**
- (b) the deployment can be completed remotely or require local meter access;**
- (c) any customer interruptions; and**
- (d) meter replacements.**

Response IR-8:

DI Apps are deployed to meters using the AMI head-end system. DI App licensing and software retrieval are managed through applications included in the DI App platform.

- (a) Yes, DI Apps will be deployed on existing AMI meters.
- (b) Deployment will be completed remotely.
- (c) DI Apps operate independently of meter metrology functions. Customer interruptions are not required to deploy DI Apps.
- (d) Not all DI Apps are compatible with all meter types. On occasion, there may be a need to replace a meter to enable a particular DI App to function within a pilot use case. NS Power will be actively looking to minimize these situations.

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Request IR-9:

Please explain whether the DI Apps will replace, supplement, or modify existing meter hardware, meter software, head-end systems, or other infrastructure.

Response IR-9:

Not all DI Apps are compatible with all meter types. On occasion, there may be a need to replace a meter to enable a particular DI App to function within a pilot use case. However, generally speaking, replacement of existing meter hardware or communications infrastructure is not required to deploy the DI Apps planned for inclusion in this Project. Deployment of these DI Apps will leverage the existing AMI infrastructure through integration of the AMI head-end system with the cloud-based DI Platform. Please also refer to IR-8, part (d).

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Request IR-10:

Please explain whether the existing AMI meters and associated communication system support peer-to-peer meter communication.

(a) If no, please explain how NS Power plans to enable such a function for the proposed DI Apps. What protocols or network capabilities are required?

(b) If yes, please describe how AMI meters communicate with each other and with NS Power's head-end systems for the proposed DI apps.

Response IR-10:

Yes, the existing AMI meters and associated communication system support peer-to peer meter communication.

(a) N/A.

(b) AMI meters communicate with each other using power line carrier (PLC) and radio frequency (RF) mesh technologies. Meter data is then communicated to the AMI head-end system using cellular backhaul communications. All communications utilize the existing AMI security architecture. Please also refer to IR-7.

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Request IR-11:

Please explain whether the DI apps could affect meter functions, such as security, integrity, performance, communications, accuracy, and firmware. Please provide the controls that prevent the DI Apps from interfering with revenue-metering functions.

(a) Please define the pilot project scope, including the number of meters, meter groups, geographic areas, feeders, and customer segments.

(b) Please explain how NS Power determined the deployment locations, customer segments, and sample size.

(c) Please describe the pilot testing approach, including testing duration, milestones, data to be collected, validation methods, performance measures, success criteria, and how NS Power will determine whether each DI App performed as expected; and

(d) Please explain how the pilot test results will be used to support the decision to proceed to full deployment or cancellation of all apps or any specific app.

Response IR-11:

DI Apps do not affect meter functions, such as security, integrity, performance, communications, accuracy, and firmware. DI Apps are installed in a secure, isolated software environment on the meter that is separate from the meter's core metrology functions. This separation ensures that the DI Apps can operate independently without affecting billing, measurement, or other core meter functions.

NS Power will continue to utilize established AMI system controls and existing meter data validation processes to ensure the integrity of revenue-metering functions while evaluating the

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1 operational capabilities of the DI Apps. The use of DI App functionality is also governed by the
2 Measurement Canada Notice of Approval for NS Power's AMI meters and associated firmware.

3
4 (a-c) The detailed design phase of the Project involves finalizing the full pilot requirements and
5 scope, formalizing the selection criteria for DI App meter group deployment (e.g.
6 geographic location, feeders, customer segments), and developing test plans, validation
7 approaches, and evaluation criteria for individual DI Apps and the overall pilot Project.

8
9 As set out in the Project Description, this Application was submitted prior to completion
10 of the detailed design phase in order to align with the timelines associated with the NRCan
11 funding. The detailed design phase of the Project will begin prior to end of Q3 2026.
12 Accordingly, NS Power is unable to provide the requested details at this time.

13
14 As part of the funding agreement for this Project, NS Power is required to provide
15 performance information to NRCan, specifically the following Key Performance
16 Indicators:

- 17
18 • Operational performance and business impact indicators (minimum target of 3);
19 • Customer performance and impact indicators (minimum target of 3);
20 • Knowledge dissemination indicators (minimum target of 3); and
21 • Longitudinal outcome indicators (minimum target of 3).

22
23 (d) As noted above in part (a-c), detailed performance measures and evaluation criteria have
24 not yet been finalized and will be developed during the upcoming detailed design phase.
25 Success criteria will be established for each DI App being tested through the Pilot to
26 determine the efficacy of the technology and confirm whether DI Apps can lead to feasible
27 long-term solutions if deployed at scale.

28
29 Following evaluation, individual DI Apps may be recommended for further evaluation,
30 continued pilot operation, future large-scale deployment consideration, deferment, or

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1 discontinuation based on the results obtained. Future DI App deployment decisions outside
2 this pilot Project would be subject to internal business evaluations, governance reviews,
3 funding approvals and regulatory processes, as applicable.

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Request IR-12:

Please identify whether NS Power has consulted with other utilities where similar DI Apps have been deployed about the results, benefits, and limitations.

Response IR-12:

NS Power reviewed information relating to similar DI App deployments, pilot programs, and application evaluations performed in other jurisdictions, as well as information provided by Itron regarding industry experience, implementation approaches, use cases, observed benefits, deployment considerations, and lessons learned.

NS Power has identified a number of utilities that have successfully piloted or deployed DI applications, including:

- Tampa Electric Company (TECO)
- CenterPoint Energy
- Pacific Gas & Electric (PG&E)
- Xcel Energy
- LUMA Energy

NS Power also reviewed information provided by Itron regarding deployments and evaluations performed by the utilities noted above. This information included reported application performance, use cases, operational outcomes, implementation considerations, and lessons learned from pilot and production deployments. Please refer to IR-2 Attachment 5.

NS Power also considered information provided by Tampa Electric Company (TECO), an Emera-affiliated utility about the utility's experience with deployment and evaluation of DI Apps.

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- 1 The information reviewed by NS Power identified the importance of validating the benefits of the
- 2 DI App technology within each utility's operating environment prior to broader deployment. These
- 3 findings contributed to NS Power's decision to pursue a pilot approach.

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Request IR-13:

In “Why do this project this way?,” NS Power noted that:

At this stage, the following apps have been identified for potential testing based on the criteria above:

- Location Awareness: autonomously determines which phase, feeder and transformer meters are on using communication and data.**
- Meter Bypass Detection: detects attempts to bypass the meter using high-resolution sampling of voltage and current data.**
- Advanced Temperature Monitoring: uses high-resolution temperature readings and communication to detect meter socket problems before they create a safety hazard or interrupt service.**
- EV Awareness: provides near-real-time disaggregation information for when an EV begins or stops charging.**
- Advanced Transformer Load & Voltage Monitoring: provides near-real time monitoring of distribution transformer load and voltage statistics.**
- Feeder Visibility: Leverages the results of the Advanced Transformer Load & Voltage Monitoring apps to provide operational insights at the feeder level.**
- Advanced Outage Analytics: Leverages data from multiple apps and the Head End System to provide power outage indication and scope, as well as an associated confidence factor.**
- Operations Optimizer - Revenue Assurance: Leverages data from the Meter Bypass Detection App to prioritize meters for investigation and support revenue assurance.**

(a) Please describe the cost structure of each app, including how the app has been charged, per installation or per function.

(b) Please describe the existing operational or customer service issues each app is intended to address, and the benefit of using the proposed app.

(c) For each proposed DI App, please explain whether NS Power can achieve the same or similar function through existing alternatives or improved processes.

(i) If no, please explain why.

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- 1 **(ii) If yes, please explain why NS Power still needs the app.**
2
- 3 **(d) For each proposed DI app, please describe the incremental cost, expected incremental**
4 **benefit, avoided cost, efficiency gain, or other customer service improvements**
5 **associated with the app. Explain how NS Power determined that the proposed app is**
6 **a better option compared with available alternatives.**
7
- 8 **(e) Please describe how NS Power will determine whether any app provides a future**
9 **customer value to deploy at scale.**
10
- 11 **(f) For the Location Awareness app, please explain the current issue with the use of**
12 **communication channels and data, and why it is important.**
13
- 14 **(g) For the Meter Bypass Detection app, please explain the current scale of meter bypass**
15 **tampering or related revenue loss issues. Please explain NS Power's current strategies**
16 **and how an app would improve the detection, but not the AMI system.**
17
- 18 **(h) For the Advanced Temperature Monitoring app, please describe the existing issues**
19 **and historical frequency and impact of these events. Please explain how the app would**
20 **reduce the mentioned risks, and whether the combination of customer reporting and**
21 **the existing AMI system could address the issue at a lower cost.**
22
- 23 **(i) For the EV Awareness app, please describe current issues caused by EV charging.**
24 **Please explain how the app can monitor the process and resolve the issues.**
25
- 26 **(j) For the Advanced Transformer Load & Voltage Monitoring app, please explain**
27 **where and how the app would be implemented. Please describe the existing issues**
28 **with the associated transformer load and voltage. Please explain whether existing**
29 **alternatives could address the issue at a lower cost.**
30
-

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1 **(k) For the Feeder Visibility app, please describe the current feeder visibility issues and**
2 **their impact. Please explain why existing feeder protection and monitoring systems**
3 **are not sufficient, and how the app can provide a more adequate service.**

4
5 **(l) For the Advance Outage Analytics app, please explain the current outage-monitoring**
6 **and response process, and explain the existing issues the app is intended to address.**
7 **Please explain why the existing AMI system cannot be used to address the issue.**

8
9 **(m) For the Operations Optimizer app, please explain the existing issues and current**
10 **investigation and evaluation process. Please explain how the app can improve the**
11 **process.**

12
13 Response IR-13:

14
15 **(a) Each DI App and back-office software application includes an initial license for up to**
16 **20,000 meters. Pricing for each DI App is comprised of software licensing fees and**
17 **maintenance and support fees.**

18
19 **(b-c) Please refer to Attachment 1.**

20
21 **(d) Please refer to Attachment 1, column J for the incremental cost and column H the potential**
22 **benefits or efficiency gains/improvements which will be examined as part of this Project.**
23 **Avoided costs and other measurable benefits cannot be quantified at this stage because the**
24 **technology has not yet been tested or validated within NS Power's operational system. This**
25 **project involves local, practical application of the DI Apps to determine whether they will**
26 **lead to feasible long-term solutions and determine what, if any certain customer value can**
27 **be achieved through future broad-scale implementation. Avoided costs and measurable**
28 **benefits will be further examined during the project and inform future scaling decisions.**

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1 (e) The project will establish application-specific evaluation criteria, and performance
2 measures during the detailed design phase which will begin prior to the end of Q3 2026.
3 Evaluation criteria will consider technical performance, deployment and support
4 requirements, customer and grid benefits, and operational outcomes and improvements
5 associated with each DI App tested through the pilot.

6
7 Results and learnings will be documented and used to determine whether individual
8 applications should be scaled, modified, deferred, or discontinued. Justification for any
9 future deployment of DI App at scale will be determined in accordance with NS Power's
10 CEJC criteria and a regulatory application will be submitted to the NSEB for approval, as
11 appropriate.

12
13 In addition, as set out in IR-11, part (a-c), NS Power is required to provide performance
14 information to NRCAN, including specific KPIs, as part of the funding requirements for this
15 project.

16
17 (f) NS Power does not currently have any communication channels or access to data that
18 validates meter to transformer/feeder connectivity or provides phasing information. This
19 data is important for improved operational awareness, outage management and restoration,
20 as well as for load balancing, distribution planning, and other advanced distribution
21 applications.

22
23 (g) In 2025, NS Power identified 21 confirmed instances of theft and to date in 2026, NS Power
24 has identified 10 instances. NS Power's AMI System currently supports theft identification
25 through tamper alert messages and detailed profiles of customer consumption over time.
26 The Meter Bypass Detection and Operations Optimizer - Revenue Assurance Apps analyze
27 meter measurements and operating data to identify conditions that may indicate meter
28 bypasses, meter tampering, wiring irregularities, or other forms of unmetered consumption.
29 The additional analytics provided by the App may help identify instances of theft even
30 earlier, and may minimize the amount of back office and field investigation required in the

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1 revenue assurance process. This project will evaluate the app's ability to effectively build
2 upon existing AMI functionalities in support of further improvement with respect to the
3 timeliness and effectiveness of revenue assurance activities and to reduce the overall time
4 required to initiate a field visit to assess potential occurrences of theft. Please also refer to
5 Attachment 1 for more information on current strategies (existing alternatives) and how
6 this DI App may improve the theft detection process.

7
8 (h) Since AMI deployment, NS Power has responded to approximately 40 high temperature
9 alarms per year. Conditions associated with these alarms range from false positives, where
10 no issue is identified by field crews, to emergency responses where electrical issues are
11 found within the customer's meter base. This project will evaluate the app's ability to
12 improve the effectiveness of temperature monitoring by pro-actively identifying trends and
13 anomalies within the meter, reducing reliance on custom reporting and office analysis.

14
15 (i) Visibility into EV charging behaviour on the system is currently limited. Insights are
16 primarily derived from interval consumption analytics. This data can only be provided after
17 the charging activity has occurred, limiting NS Power to reactive EV monitoring only. The
18 EV Awareness DI App can provide near-real-time disaggregation information for when an
19 EV begins or stops charging, identifying and monitoring electric vehicle charging activity
20 while the charging activity is occurring behind customer meters ultimately providing
21 enhanced, proactive information regarding EV charging behavior.

22
23 (j-k) Deployment locations will be determined during the detailed design phase and will be
24 informed by operational, engineering, and reliability considerations. Please refer to IR-11
25 part (a-c).

26
27 NS Power's existing operational technology systems provide critical feeder visibility,
28 primarily at the feeder head and limited other downline devices, such as connected
29 reclosers. The Advanced Transformer Load Monitoring, Advanced Transformer Voltage
30 Monitoring DI Apps, and Feeder Visibility back-office application, will aggregate grid-

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1 edge operational insights for each transformer along the full feeder extent, leveraging the
2 data from the Location Awareness. Through these insights, increased awareness of load
3 and voltage conditions throughout the distribution system can support operational decision
4 making.

5
6 (l) Advanced Outage Analytics is no longer planned for testing through the pilot scope.
7 Through ongoing discussions with Itron, compatibility limitations were identified between
8 this DI App and the version of the AMI meters currently deployed by NS Power. The
9 estimated cost associated with this DI App will be reallocated to additional software
10 licenses DI Apps currently planned for inclusion in the pilot. The final list of DI Apps and
11 number of licenses will be determined during the detailed design phase of the project.

12
13 (m) Operations Optimizer – Revenue Assurance is a back-office application enabled by the
14 DI Platform that leverages outputs from the Meter Bypass Detection DI App to support
15 prioritization of meters for investigation and evaluation.

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Request IR-14:

Please explain why Itron was selected.

Was any request for proposal (RFP) process applied?

(a) If no, please explain why.

(b) If yes, please provide the complete procurement record for the project, including the RFP, a summary of all submitted proposals, the evaluation criteria for successful proposals. Please provide a copy of proposal from the successful bidder.

Response IR-14:

The DI Apps solution is a proprietary solution offering provided by Itron. This grid-edge solution is an extension of the Itron AMI solution installed by NS Power. It is designed to operate within NS Power's existing Itron AMI ecosystem, including the Itron AMI meters, associated communications infrastructure, and the existing Itron headend system. The DI Apps solution utilizes Itron-specific platform services, application management capabilities, firmware support, and interfaces that are integrated with the existing Itron AMI environment. The Itron DI App solution is not operable with non-Itron environments. Accordingly, an RFP process was not conducted.

(a) An RFP process was not conducted due to the proprietary nature of the solution.

(b) N/A.

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Request IR-15:

In the project cost estimate table on page 5:

(a) For Consulting Category:

(i) Please describe the scope of work, responsibilities, deliverables, hourly rates or pricing basis, for Professional Services, Cyber Security Risk Assessment, and Project Management.

(ii) Please explain why consulting work could not be completed by NS Power internal staff.

(b) For Software Category:

(i) Please provide the detailed cost of the software licence charge and explain whether the software licence charged per unit or whether it requires annual subscriptions.

(ii) Please provide the detailed cost of the Software Hosting/Setup charge.

(c) For Capital Contributions:

(i) What is the NRCAn program name?

(ii) Please describe the NRCAn funding eligibility rules and restrictions on use of funds.

Response IR-15:

(a)

(i) Professional Services are intended to support planning, design, configuration, deployment preparation, integration planning, validation planning, training preparation, and pilot implementation activities associated with the Distributed Intelligence (DI) Platform and selected DI applications. These services are expected

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1 to be provided primarily by Itron subject matter experts and implementation
2 resources.

3
4 The Professional Services estimate is based on vendor-provided budgetary pricing,
5 Statements of Work, and implementation assumptions supporting the Planning &
6 Design phase and subsequent pilot activities.

7
8 The project includes cybersecurity review activities to assess the proposed solution
9 architecture, cloud-hosted components, external connectivity, access controls,
10 integrations, data flows, and security requirements associated with the DI Platform.
11 A Technology Cybersecurity Risk Assessment was initiated as part of project
12 planning and remains in progress.

13
14 The estimate includes cybersecurity consulting support associated with completion
15 of the cybersecurity review activities.

16
17 Project Management activities support project planning, governance, scheduling,
18 stakeholder coordination, vendor management, risk management, reporting, project
19 controls, and delivery oversight. Responsibilities include management of project
20 scope, schedule, resources, budget, governance approvals, and pilot execution
21 activities.

- 22
23 (ii) The project requires specialized knowledge of the Itron Distributed Intelligence
24 Platform, associated DI applications, proprietary platform architecture, application
25 configuration, deployment processes, validation methodologies, and integration
26 requirements. These capabilities are proprietary to the vendor solution and are not
27 currently maintained within NS Power.
28

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1 Internal NS Power resources will participate throughout the project and provide
2 business, operational, engineering, cybersecurity, AMI, GIS, analytics, and project
3 delivery expertise.

4
5 However, vendor expertise is required to support planning, configuration,
6 deployment preparation, architecture design, software implementation, training,
7 validation, and implementation activities associated with the DI Platform and
8 applications.

9
10 Accordingly, the consulting services are intended to complement internal resources
11 and provide specialized expertise associated with the Itron Distributed Intelligence
12 Platform.

13
14 (b)

15 (i) The software cost estimate consists of platform licensing, application licensing,
16 maintenance, and subscription-based services associated with the DI Platform and
17 selected DI applications.

18
19 The vendor pricing structure is based on licensed endpoint populations and
20 associated application subscriptions rather than customer usage levels. Individual
21 applications include varying combinations of license, maintenance, and
22 subscription fees.

23
24 Detailed application-level pricing is included within the vendor pricing
25 documentation filed in support of the project.

26
27 (ii) The Software Hosting/Setup estimate is supported by the vendor pricing
28 documentation filed in support of the project and includes DI Platform hosting
29 services, cloud-hosted platform infrastructure, Enterprise Application Center

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1 (EAC) services, platform setup and configuration activities, software provisioning
2 and deployment activities, and application onboarding activities.

3
4 (c)

5 (i) The project is supported through Natural Resources Canada's Energy Innovation
6 Program (EIP) – Smart Grid Demonstration. The funding applies to three separate
7 projects. The projects include Distributed Intelligence (DI Apps), C0071528 Fault
8 Location, Isolation and Service Restoration (FLISR), and C0068718 Distributed
9 Energy Resource Management Systems (DERMS).

10
11 (ii) NS Power was eligible for the NRCan program as it is a legal entity validly
12 incorporated in Canada and proposed demonstration projects that address
13 technological challenges by deploying and validating market concepts.

14
15 A condition to receive this funding is NSEB approval of all three projects prior to
16 issuance of any funds. All projects, including capital execution and operational
17 evaluation, must be completed by March 31, 2028.