



VIWAPA HIGH LEVEL SOLUTION SUMMARY

1. Objectives

VIWAPA desires to implement a **turnkey** AMI solution which meets the following objectives. VIWAPA expects a single AMI vendor, with support from contractors hired and managed by the AMI vendor, to perform all these functions without VIWAPA personnel involvement.

- Replaces all of the existing population of AMI electric meters (Approximately 54,000) with latest technology AMI meters communicating over an AMI communications network, or where required alternative communications, such as direct cellular, and provides automated meter reading at better accuracy and reliability than the existing AMI meter reading services. This replacement should be performed in the most economic fashion allowing VIWAPA to choose from a 18 month, 24 month or 36 month deployment. The complete installation of network and meters in U.S Virgin Islands (St. Thomas, St. Croix, St. John and Water Island) will be completed by no later end of 2027.
- Provides automated billing (cycle as well as off cycle) of any installed AMI electric meter within 5 days of the meter installation or field retrofit.
- Provides remote connect or disconnect functionality of any installed AMI self-contained electric meter as soon as that AMI electric meter is installed.
- The solution meets all business requirements defined in the AMI Meter to Bill, AMI Connect and Disconnect, AMI Event Management and AMI Asset Management business processes.
- The AMI Solution (AMI Electric HES and AMI Network Devices) will be monitored, managed and operated by vendor personnel with cloud-based software technologies (AMI HES) and AMI network services and meet the data accuracy and reliability standards expected of the AMI solution. The AMI Vendor will provide any and all remote activities to monitor and troubleshoot deployed devices and VIWAPA will support field activities to replace non-functioning devices.
- Provides analytics and reporting to identify revenue protection opportunities and operational trends or issues.
- The solution provides a foundation for the future implementation of water AMI metering, streetlights, advanced analytics, distributed intelligence, distribution automation, and other services and capabilities.

2. Technologies and Partners

VIWAPA expects to use the following technologies and partners for the achievement of the above objectives:

- **AMI Vendor** AMI electric meters
- **AMI Vendor** AMI RF Network devices
- **AMI Vendor** AMI Head End System (HES) software and Analytics
- **AMI Vendor** Managed Services for AMI HES and Analytics software (QA and Production environments (with Disaster Recovery) required)



- **AMI Vendor** should be prepared to support Water Metering and Street Light Management at a future date.
- **Meter Sense** MDMS and integration
- **Central Square** CIS and integration
- **AMI Vendor** project management, RF network design, information systems configuration and integration services, Network Device installation services and electric meter installation field installation services.
- **Z2Solutions** AMI Program Management Services

3. Solution Components

3.1. AMI Electric Meters

VIWAPA will procure and **AMI Vendor** will install AMI Electric meters to replace the existing electric meters throughout the territory. **VIWAPA** expects that any AMI Electric meter will be successfully discovered by the AMI network and begin transmitting meter reading, power quality and alarm data with a minimum reliability of 90% within 24 hours of installation and fully validated and commissioned within 120 hours of installation.

The activities and responsibilities necessary to meet this expectation include:

- Establish asset management strategy and system of record, including warranty tracking and management (**VIWAPA** responsibility, with support from **Z2Solutions**)
- Definition of meter programs (configuration), labels, shipping requirements (**VIWAPA** responsibility, with support from **Z2Solutions** and **AMI Vendor**)
- AMI meter and tool training (**AMI Vendor** responsibility)
- Establish Factory Acceptance Test Plan (**VIWAPA** responsibility, with support from **Z2Solutions**)
- Produce AMI meters against the documented configuration specification (**AMI Vendor** responsibility)
- Validate and accept first article meters (**VIWAPA** responsibility, with support from **AMI Vendor** and **Z2Solutions**)
- Establish meter rollout schedule (**AMI Vendor** responsibility, with approval by **Z2Solutions**)
- Establish purchase order and delivery expectations for AMI electric meters (**VIWAPA** responsibility)
- Establish communication plan and material to be used for AMI meter rollout (**VIWAPA** responsibility, with support from **Z2Solutions**)
- Establish meter installation standards and rules of conduct for installers (**VIWAPA** responsibility, with support from **Z2Solutions**)
- Establish Opt Out policy (**VIWAPA** responsibility, with support from **Z2Solutions**)
- Receive incoming AMI Electric Meters (**AMI Vendor** responsibility)
- Onboarding and training of installation contractors (**AMI Vendor** responsibility, with approval by **VIWAPA** and **Z2Solutions**)
- Training of **VIWAPA** metering personnel (**AMI Vendor** responsibility)



- Distribute and track AMI Electric Meters to installers (**AMI Vendor** responsibility)
- Provide population data as necessary for AMI Vendor to manage the AMI Electric Meter deployment (**VIWAPA** responsibility, with support from **Z2Solutions**)
- Create service orders in AMI Vendor Installation Management software (**AMI Vendor** responsibility)
 - NOTE: *Dependency with software configuration and integration*
- Install AMI Electric Meters (**AMI Vendor** responsibility)
 - NOTE: **AMI Vendor** will be responsible for installing all meters, except for those few meters mutually agreed as VIWAPA responsibility. If the installation of an AMI electric meter is prevented by a VIWAPA customer, VIWAPA will resolve the issue with the customer and the AMI Vendor will complete the installation.
- Validate all installation records and data prior to upload to CIS (**AMI Vendor** responsibility). VIWAPA expects less than 0.5% data exceptions resulting from incorrect installation records, including pictures.
- Identify and resolve installation issues and meters that can't be installed as part of normal rollout (**AMI Vendor** responsibility, with support from **VIWAPA**)
- Provision and validate newly installed AMI meters (**AMI Vendor** responsibility working with Central Square).
 - NOTE: VIWAPA CIS will provide the provisioning (MeterAdd, MeterRemove, MeterUpdate, ServiceLocationChanged) notification to AMI HES based on the agreed upon integrations between CIS and AMI HES.
- Identify and resolve communications failures for any installed AMI Electric Meter which fails to achieve commissioning minimum performance within 10 business days (**AMI Vendor** responsibility)
- Establish and conduct monitoring processes for commissioned AMI electric meters and notification processes where field investigation or reporting is required (**AMI Vendor** responsibility, with approval by **VIWAPA** and **Z2Solutions**)
 - NOTE: Until AMI electric meter becomes commissioned or optimized, **AMI Vendor** will be responsible for the monitoring and, if required, maintenance of the AMI Electric meter.
- Establish and conduct field maintenance processes for commissioned AMI electric meters (**VIWAPA** responsibility, with support by **Z2Solutions**)
- Build AMI test lab to support testing, FAT and ongoing firmware and configuration validations (**VIWAPA** responsibility, with support by **Z2Solutions**)
- Establish Incoming commodity testing process for incoming new AMI meters (**VIWAPA** responsibility, with support by **Z2Solutions**)
- Establish specific installation processes and handling for "special" customers (**VIWAPA** responsibility, with support by **Z2Solutions**)
- Dispose of all removed electric meters (**AMI Vendor** responsibility)
- Managed RMA process until the completion of the Meter Deployment (**AMI Vendor** responsibility)



3.2. AMI Communications Network

VIWAPA will procure and **AMI Vendor** will receive, inspect, install and validate AMI RF Network devices to establish a communications umbrella to provide reliable communications to all of the installed AMI Electric Meters and, in the future, street lights and AMI Water Meters. **VIWAPA** will use third party cellular networks or utility owned fiber to establish backhaul communications from the Network devices to the **AMI Vendor** NOC (Network Operations Center).

The activities necessary to meet this expectation include:

- Establish asset management strategy and system of record, including warranty tracking and management (**VIWAPA** responsibility, with support from **Z2Solutions**)
- Establish network monitoring and maintenance organization and roles/responsibilities (**AMI Vendor** responsibility)
- Network design (**AMI Vendor** responsibility, with **Z2Solutions** approval)
 - NOTE: **VIWAPA** will provide accurate GPS latitude and longitude information for at least 80% of the meters and AMI Vendor will establish and document “buffer stock” to accommodate the lack of detailed mapping information.
- Backhaul requirements and design (**AMI Vendor** responsibility, with support from **VIWAPA**)
- Network surveys and documentation of site requirements, including make ready work and mounting brackets (**AMI Vendor** responsibility)
- Network equipment order, including antenna and brackets (**VIWAPA** responsibility, based on AMI Vendor surveys)
- Network equipment receipt and inspection (**AMI Vendor** responsibility)
- Network equipment training (**AMI Vendor** responsibility)
- Pole replacement/installation as necessary for network equipment (**VIWAPA** responsibility, based on AMI Vendor surveys)
- Make ready work, including installation of mounting arms, prior to collector/router installation (**AMI Vendor** responsibility)
- Network equipment and antenna installation, including power connection (**AMI Vendor** responsibility)
- Network equipment validation and commissioning, including commissioning of backhaul (**AMI Vendor** responsibility)
- Establish back office maintenance and monitoring processes for Network equipment (**AMI Vendor** responsibility)
- Establish field maintenance and troubleshooting processes for Network equipment and provide training for **VIWAPA** (**AMI Vendor** responsibility, with support from **VIWAPA** and **Z2Solutions**)

3.3. AMI HeadEnd System Configuration and Integration

VIWAPA will procure, via cloud-based services, and configure, via **AMI Vendor** setup and configuration services, the AMI HES **AMI Vendor** AMI HES Platform to manage the automated discovery, commissioning, monitoring, communication, data collection, firmware management and control from all AMI endpoints (AMI Network Devices and AMI Electric Meters. **VIWAPA** will use the hosted AMI HES to



commission and monitor all AMI meters and perform all of the over the air maintenance and monitoring activities to ensure the communications network is operating at optimum performance and failed devices are identified in a timely fashion. It is expected that the **AMI Vendor** will lead and document any workshops and design discussions necessary to establish the configurations of the AMI HES and the integrations (CIS-AMI HES, MDMS-AMI HES, CIS-Installation Management System, GIS-AMI HES (if required), etc.). It is expected that the **AMI Vendor** will establish an integration which does not require any customization by the Central Square CIS (To be clear, the Central Square CIS utilizes batch file integrations and the **AMI Vendor** will establish any translation and conversion necessary to adapt these files to the AMI HES standard interfaces).

AMI Vendor will integrate with the MeterSense MDMS and Central Square CIS to meet all of the business requirements for the AMI solution as documented in VIWAPA's business requirements.

The activities necessary to meet this expectation include:

- Establish AMI business processes (**VIWAPA** responsibility, with support from **Z2Solutions**)
- Establish AMI business requirements which will define the configurations and functionality required from AMI Network Solution (**Z2Solutions** responsibility, with support from **VIWAPA**)
- Establish, document and maintain the AMI solution and integration architecture (**Z2Solutions** responsibility, based on input from **AMI Vendor**, **Meter Sense** and **Central Square**)
- Establish AMI Operations organization and roles/responsibilities (**VIWAPA** responsibility, with support from **AMI Vendor**)
 - NOTE: VIWAPA's AMI Operations organization will be responsible for the MDMS and using the AMI Network Solution systems for data analytics and data monitoring. **AMI Vendor** will be responsible for operating and maintaining the AMI Network Solutions systems and monitoring all the endpoints and alerting **VIWAPA** for any endpoints which require field investigation or replacement.
- Define and document AMI HES configurations (**AMI Vendor** responsibility with **Z2Solutions** review/approval)
- Define and document AMI HES integrations with MeterSense MDMS (**AMI Vendor** responsibility with support from **Meter Sense** and **VIWAPA** and **Z2Solutions** review/approval)
- Define and document AMI HES integrations with Central Square (**AMI Vendor** responsibility with support from **Central Square** and **VIWAPA** and **Z2Solutions** review/approval)
- Define and document AMI Vendor Installation Management System integrations with Central Square (**AMI Vendor** responsibility with support from **Central Square** and **VIWAPA** and **Z2Solutions** review/approval)
- Backhaul requirements and design, including security (**AMI Vendor** responsibility, with support from **VIWAPA**)
- Document/Design, build and unit test CIS-side/MDMS-side integrations (**Central Square** and **MeterSense** responsibility, with approval by **Z2Solutions**)
- Document/Design, build and unit test AMI HES/MDMS and AMI HES/CIS integrations (**AMI Vendor** responsibility, with approval by **Z2Solutions**)
- Document/Design, configure and unit test AMI HES (**AMI Vendor** responsibility, with approval by **Z2Solutions**)



- AMI HES Operations Training and documentation (**AMI Vendor** responsibility)
- Provide detailed AMI HES operational processes, checklists, escalation policies, etc. with assignment of roles for each (**AMI Vendor** responsibility, with support from **VIWAPA** and **Z2Solutions**)
- Provide detailed AMI HES maintenance processes, checklists, escalation policies, etc. (**AMI Vendor** responsibility)
- Establish MDMS Operational processes, checklists, escalation policies, etc. (**VIWAPA** responsibility, with support from **Z2Solutions** and **MeterSense**)
- Establish MDMS Maintenance processes, checklists, etc. (**MeterSense** responsibility, with support from **VIWAPA** and **Z2Solutions**)
- Provide AMI HES validation and acceptance test plan which validates AMI HES configuration meets VIWAPA AMI Business Requirements (**AMI Vendor** responsibility, with **Z2Solutions** review, enhancement and approval)
 - NOTE: **AMI Vendor** is responsible for the planning, test script development, data creation and test execution for system testing of the AMI HES and capturing the results and completing the system test report for these systems. **VIWAPA** may participate in the testing by shadowing the testers. Testing must be complete and include identification and documentation of all exception conditions that may occur.
 - NOTE: **AMI Vendor**, with support from **MeterSense** and **Central Square**, is responsible for the planning and scheduling, test script development, data creation and test execution (with support from **MeterSense** and **Central Square**) for integration testing of the AMI HES with MDMS and CIS and capturing the results and completing the integration test report for these integrations. **VIWAPA** may participate in the testing by shadowing the testers. Testing must be complete and include identification and documentation of all exception conditions that may occur.
 - NOTE: **Z2Solutions** and **VIWAPA**, with support from **AMI Vendor**, **MeterSense** and **Central Square**, are responsible for the planning and test script development and data creation (data creation will utilize the **AMI Vendor** test simulation capabilities and the AMI Test Lab and **AMI Vendor** Installation Management System simulation capabilities, which will be managed by the **AMI Vendor**) for the User Acceptance Testing of the integrated solution.
- Establish Systems Integration test plan and roles/responsibilities (**SUPPLIER** responsibility, with support from **Z2Solutions**, **MeterSense** and **Central Square**)
- Unit Test AMI HES to validate configurations and internal functionality to demonstrate compliance with configuration workbook and business requirements. Provide the Unit Test Plan for review prior to start of unit testing and provide a Unit Test Report following the completion of Unit Testing. (**AMI Vendor** responsibility, with approval by **Z2Solutions**)
- Test and validate integrated AMI solution to validate the integrations and end-to-end functionality of the integrated solution and compliance with business requirements. Develop all test scripts, execute all test scripts and provide a Systems Integration Report upon completion of testing (**AMI Vendor**, **Central Square** and **MeterSense** responsibility with support from **VIWAPA** and approval by **Z2Solutions**)
 - NOTE: **AMI Vendor** has overall responsibility for Systems Integration Testing and **VIWAPA** will be responsible for User Acceptance Testing. Responsibility includes creation of test



plans and test scripts, creation of test data, execution and recording of test scripts and test reporting.

- Establish User Acceptance test plan and roles/responsibilities (**Z2Solutions** responsibility, with support from **AMI Vendor, MeterSense** and **Central Square**)
- Conduct and document User Acceptance testing (**VIWAPA** responsibility, with support from **AMI Vendor, MeterSense** and **Central Square**).
- Document integration monitoring procedures and roles/responsibility, including escalation procedures (**VIWAPA** and **AMI Vendor** joint responsibility)
- Provide training of testing personnel for AMI HES system and Integration testing (**AMI Vendor** responsibility)
- AMI HES end user training (**AMI Vendor** responsibility)
- AMI HES setup and configuration acceptance (**VIWAPA** responsibility)
- Managed Services, including SaaS, operations and administration of AMI HES (**AMI Vendor NOC (Network Operating Center)** responsibility)
- Disaster Recovery Testing of the AMI HES (**AMI Vendor** Responsibility)

4. Acceptance Testing

NOTE: Acceptance Testing is typically detailed in the SOW/Contract with the **AMI Vendor**. This information is a place holder and will be updated upon completion of contract negotiations.

Upon the successful setup, configuration and integration of the AMI systems, **Z2Solutions** will validate the deployed AMI solution, inclusive of AMI network and AMI meters, is meeting the business requirements and performance expectations through a set of Acceptance Tests. **VIWAPA** expects acceptance testing to be performed on the production systems with current customers and will conduct testing in a careful way to ensure that customers are minimally impacted by the deployment of the AMI solution, the transition of customers to the new meter reading and billing solution and these acceptance testing activities. Prior to Acceptance Testing, **VIWAPA**, with its partners, will have completed the installation and commissioning of the AMI Communications Network, the AMI Network Management hosted solution and will have completed the systems integration and testing of these systems.

As part of Acceptance Testing, **Z2Solutions** expects to validate the performance of the system is able to meet the following:

- 99.5% of intervals and registers from the previous day collected and available in the MDMS, or other utility systems by 6:00 AM next day
- 99% on-demand read successfully executed within 60 seconds
- 99% connect or disconnect operations successfully executed within 30 seconds

For consideration: VIWAPA will conduct the following graduated acceptance tests:

- Initial deployment test: **VIWAPA** (using **AMI Vendor** installation services) will install approximately 1,000 AMI electric meters in a contiguous area targeting the island of St. John. This testing will validate the installation and commissioning processes for AMI meters and all of the functionality of the AMI solution. This testing will validate the ability of AMI Vendor to meet the installation and commissioning performance metrics and the overall system operational performance metrics. This testing will also validate the ability of the solution to meet the



installation and commissioning performance metrics. The successful completion of this test will be a milestone and allow payment of some of the retained invoices.

- Final acceptance test: **VIWAPA** (using **AMI Vendor** installation services) will install, provision and commission the remainder of the AMI meters the service territory. This testing will validate the ability of AMI Vendor to meet overall system operational performance metrics. This testing will also provide an assessment of the project's ability to meet the objectives established in Section 1. This testing should also include an assessment by **AMI Vendor** of the AMI Operations and AMI Communications Network, including system tuning. This testing should be performed over a 30 day period after any system tuning and demonstrate the data collection and delivery performance and system responsiveness. The successful completion of this test will be a final milestone and allow payment of all retained invoices.