Meeting Date: 12/7/10

AGENDA REPORT

City of Santa Clara, California

Agenda Item # 6B-12

Santa Clara All-America City 2001

Date: November 16, 2010

To: City Manager for Council Action

From: John C. Roukema, Director of Electric Utility

Subject: Approval of an EnergyAxis Management System Contract with Elster Solutions, LLC. for the Purchase and Implementation of an Advanced Metering and Utility Communications Infrastructure

EXECUTIVE SUMMARY:

The Advanced Metering Infrastructure Project (Project) consists of the purchase and implementation of a utility communications infrastructure including an advanced metering program (SVP Meter Connect). The installation of a citywide communications network will provide the backbone allowing the automation of the measurement and collection of energy use and system operational data, and the operation of distribution system equipment. The Project will position the City for compliance with future regulatory requirements and support the implementation of new technologies for the efficient and reliable operation of our system. By providing a platform for new customer services, the Project will enable the City to maintain a level of service competitive with other utilities now and in the future. Such service opportunities include providing improved power outage communications and response, pertinent and timely information about energy and water usage to customers, and a broadband communication infrastructure which will support future city Government and utility applications. Additionally, this program will allow expanded and improved access by all Santa Clara residents and visitors to outdoor public Wi-Fi.

The Project will provide near-term benefits through the SVP Meter Connect program, lowering operating costs by enabling remote energy use data collection, improving the accuracy of utility bills, providing more consistent billing periods, and reducing the number of visits to customer premises for routine functions such as the turning on and off of utility service. Future benefits are expected as other applications are integrated into this platform, including enhanced outage communications and an online portal for customers to increase understanding of electricity and water use. Increased benefits will accrue over time as additional systems are integrated and functionality is expanded.

In FY08/09, a Capital Improvements Project and five-year plan was approved for the purpose of defining, procuring and implementing an Advanced Metering Infrastructure to work in conjunction with other City systems. Under this plan, Council has approved the acquisition of a Meter Data Management System through Siemens Corporation. The next phase includes the implementation of a secure IT infrastructure, integration of production and data management systems including the utility billing system, and completes the outdoor WiFi Wide Area Network.

An extensive, multi-departmental RFP process for the Project was performed, and highly competitive proposals were received from six major providers. Staff recommends the selection of Elster Solutions, LLC. Elster has produced metering infrastructure for 170 years and is highly regarded in the field.

The agreement with Elster provides for the purchase of the AMI and WiFi equipment and software, and professional services to support the necessary installation and configuration these systems. In addition, the agreement defines the ongoing support for the products. Under Phase 1 of the proposed agreement, Elster will install the EnergyAxis management system, a City-wide WiFi network and enough water and electric meters to validate the functionality meter-to-billing. Mass meter deployment will be delayed until the information transfer infrastructure is in place and fully tested. Meter deployments in future phases will be subject to funding and approval with the initial focus on our largest customers starting as early as next fiscal year.

A master services agreement will be utilized to govern all phases of the project and the equipment and services to be provided by Elster. A copy of the EnergyAxis Management System Contract with Elster Solutions, LLC is available for review in the Council offices.

ADVANTAGES AND DISADVANTAGES OF ISSUE:

Approval of the agreement will allow the City to achieve operational process improvements, improved customer service and fulfillment of existing and pending regulatory requirements. The WiFi system implementation will support the SVP Meter Connect functionality, provide broadband public access to the internet, support general economic development, and support a range of potential future municipal applications. The utilization of Elster products and services is expected to lower meter reading costs in the longer-term by collecting utility meter data and delivering field services such as remote service starts and stops, without visiting customer premises, as well as improving the accuracy and timeliness of customer utility bills.

ECONOMIC/FISCAL IMPACT:

The cost of goods, services and travel in the EnergyAxis Management System Contract with Elster Solutions, LLC is not to exceed $2,389,397.17. The cost of the first year of the Annual Software Maintenance in the EnergyAxis Management System Contract with Elster Solutions is not to exceed $115,050.08. Total not-to-exceed cost is $2,504,447.25. Funding for these services is available in the utility enterprise Capital Improvement Budget: Implementation of Advanced Metering Infrastructure, account 591-1313-80300-2111-[F]39700.

RECOMMENDATION:

That the Council approve, and authorize the City Manager to execute, the EnergyAxis Management System Contract with Elster Solutions, LLC, in an amount not to exceed $2,504,447.25, for the Purchase and Implementation of an Advanced Metering and Utility Communications Infrastructure.

John C Roukema

John C. Roukema
Director of Electric Utility

Certified as to Availability of Funds:
591-1313-80300-2111 $2,504,447.25

Gary Ameling

Gary Ameling
Director of Finance

APPROVED:

Jennifer Sparacino

Jennifer Sparacino
City Manager

MAJORITY VOTE OF COUNCIL

Documents Related to this Report:
1) EnergyAxis Management System Contract with Elster Solutions, LLC

ENERGYAXIS® MANAGEMENT SYSTEM CONTRACT

BETWEEN

CITY OF SANTA CLARA, CALIFORNIA

AND

ELSTER SOLUTIONS, LLC

[DATE]

MASTER AGREEMENT

THIS MASTER AGREEMENT (this "Agreement") is entered into between **Elster Solutions, LLC,** a Delaware limited liability company ("Elster" "Contractor" or "Seller"), and City of Santa Clara, California, a chartered California municipal corporation, (hereinafter referred to as "City" or "Licensee"). Together Elster and City shall be known as "the parties".

1. **Entire Agreement.** This Master Agreement, together with the Exhibits attached hereto constitute the entire Agreement between the City and Contractor. No other understanding, agreements, conversations, or otherwise, with any representative of City prior to execution of this Agreement shall affect or modify any of the terms or obligations of this Agreement. Any verbal agreement shall be considered unofficial information and is not binding upon the City except where amended by written change and signed by both parties hereto. This Agreement shall include:

   a) Master Agreement
   b) Exhibit A – Statement of Work and corresponding Phases and Calls
   c) Exhibit B – Elster Software License Agreement
   d) Exhibit C – Elster System Maintenance Agreement
   e) Exhibit D – Elster Equipment Maintenance Agreement
   f) Exhibit E- Insurance Requirements
   g) Exhibit F- Ethical Standards for Contractors Seeing to Enter into an Agreement with the City of Santa Clara, California
   h) Exhibit G- Affidavit of Compliance with Ethical Standards
   i) Exhibit H – Technical and Functional Requirements
   j) Exhibit I- Tropos Standard License Agreement
   k) Exhibit J- Confidential Pricing Schedule

   The Elster Software License Agreement and System Maintenance Agreement are included herein since their signing by the City is a requirement for completion of the Master Agreement. They will survive and remain in effect as per their individual requirements after this Master Agreement is ended or terminated.

2. **Term of Agreement.** Unless otherwise set forth in this Agreement or unless this paragraph is subsequently modified by a written amendment to this Agreement, the term of this Agreement shall begin on the Effective Date of this Agreement through December, 31, 2015. The Agreement shall terminate at 11:59 p.m. on December 31, 2015.

3. **Supply.** This Master Agreement will cover the supply of certain goods, software and services as delineated herein to provide an Advanced Metering Infrastructure (AMI) system (the "System") for electric meters for City.

4. **The Project.** Elster shall sell the equipment (the "Equipment"), provide the services (the "Services"), and license to City the software (the "Software") described in Exhibit A-Statement of Work attached hereto and incorporated herein by reference for the prices shown in Section 6 herein. The duration of the Project is expected to run from the Effective Date through December 31, 2015, subject to an overall project schedule to be determined during system planning that is mutually agreeable to and signed off on by the parties.

5. **Applicable Terms.**

   a) All Equipment and Services shall be sold and delivered pursuant to the Master Agreement.

b) All Software shall be licensed pursuant to a separate software license agreement to be executed by the parties in the form of the Software License Agreement, attached hereto and incorporated herein by reference as Exhibit B - Software License Agreement.

c) After installation, support for the software system will be provided by Elster in accordance with a System Maintenance Agreement (SMA), attached hereto and incorporated herein by reference as Exhibit C - System Maintenance Agreement, Exhibit D – Equipment Maintenance Agreement. Exhibit I– Tropos Standard License Agreement.

6. **Prices.** In consideration of the Equipment and Services, City shall pay Elster the amounts listed in Exhibit J, Confidential Pricing Schedule, in U.S. Dollars. The amounts listed in the pricing table of Exhibit J, Confidential Pricing Schedule, are binding.

a) Unless otherwise specified by Elster, the price does not include any federal, state or local property, license, privilege, sales, use, excise, gross receipts, or other like taxes which may now or hereafter be applicable. The City will assume the payment of all taxes, duties, fees and other charges assessed by any taxing authority in the City's country or country of ultimate destination with respect to the goods order. The City agrees to pay or reimburse any such taxes, duties, fees or other charges which Elster or its suppliers are required to pay or collect. If the City is exempt from the payment of any tax or holds a direct payment permit, the City shall, upon order placement, provide Elster a copy, acceptable to the relevant governmental authorities of any such certificate or permit.

b) Notwithstanding the foregoing, Elster reserves the right to increase the pricing set forth in Exhibit J for goods only, upon each anniversary date of the completion of the Implementation and O &M Phases of the Agreement, by an amount not to exceed that necessary to bring the pricing equal to the then current lowest list price for such goods.

c) Custom Integration - None is included in the base Contract scope. If Elster is subcontracted for integration work, City will provide Elster with legal access to any formats or protocols necessary to develop the file structures and will provide suitable and timely support for testing support at no cost to Elster. Elster will not unreasonably withhold cooperation with any City financial or utility billing software vendor. Integrated software produced by Elster will be licensed to City under the Software License Agreement and supported under the System Maintenance Agreement.

7. **Payment.** City shall pay for Elster deliverables per the following payment schedule:

a) **Elster meters** - will be invoiced FOB point of shipment from its factory and paid for per the terms of the Elster General Terms and Conditions.

b) **Elster EA_MS Software License Fees** – The Base Software license fee and initial Per Meter License fees will be invoiced upon completion of EA_MS installation and training at site. Additional per meter fees will be issued after periodic audit, but not more than quarterly each year. No credit will be given for audits resulting in fewer meters on the EA_MS system.

c) **System Maintenance fees** - Will be billed upon completion of Software installation and training for the first partial calendar year after installation and annually thereafter unless terminated by City.

d) **Project Support Services** - will be invoiced in accordance with Exhibit A Statement of Work. **Travel and living expenses** – Expenses for Elster personnel for on-site work shall be billed monthly at its cost plus ten percent (10%) upon completion of the travel. Airfare will be via coach fare, moderate hotel accommodations, with receipts to be submitted for expenses over $25.

e) **Payment terms** are net cash, payable without offset, in United States Dollars, by check or by wire transfer to the account designated by Elster due 30 calendar days from date of invoice. For any amount past due, the City shall pay, in addition to the overdue payment, a late charge equal to the lesser of 1 1/2% per month or any part thereof or the highest applicable rate allowed by law on all such overdue amounts plus Elster's attorneys' fees and court costs incurred in connection with collection.

8. **Delivery Terms.**

a) All goods manufactured, assembled or warehoused in the continental United States and to be delivered within the United States are delivered FOB Elster factory point of shipment. Goods delivered outside the United States will be delivered Ex Works, and the City shall arrange for export clearance. The City shall be responsible for any and all demurrage or detention charges. This is Elster's standard delivery term.

b) If the City requests and Elster agrees in a Proposal that goods shall be delivered FOB point of destination, Elster will deliver such goods FOB point of destination as selected by the City with all freight costs prepaid by Elster. In order for Elster to cover the administrative, insurance, and logistic expenses involved with FOB point of destination deliveries, Elster shall add to the amount invoiced to the City an amount equal to 2% of the purchase price of the goods being delivered. This amount will be added to the invoice as a separate line item.

c) If the scheduled delivery of goods is unreasonably delayed by the City or by Force Majeure, Elster may move the goods to storage for the account of and at the risk of the City whereupon it shall be deemed to be delivered.

d) Shipping and delivery dates are contingent upon the City's timely approvals and delivery by the City of any documentation required for Elster's performance hereunder.

e) Claims for shortages or other errors in delivery must be made in writing to Elster within ten (10) days of delivery. Goods may not be returned except with the prior written consent of and subject to terms specified by Elster. Claims for damage after delivery shall be made directly by the City with the common carrier.

f) Unless otherwise agreed in writing by the parties, the City shall be responsible for any required export/import licenses. The obligations of the City to pay for the goods shall not in any manner be waived by the delay or failure to secure or renew, or by the cancellation of any required export/import licenses.

g) Delivery terms for the Software shall be as set forth in the Software License Agreement - Exhibit B.

9. **Inspection and Acceptance.** The City shall have up to thirty (30) days after delivery of the goods to the specified delivery point to inspect and reject or accept the goods in writing. Failure to reject the goods in writing, citing any applicable non-conformity to a purchase order, order release or specification during such time shall be deemed acceptance of the goods.

10. **Title and Risk of Loss.** Title to the goods shall pass to the City upon its receipt of the good determined by the City's choice of delivery according to either 5 (a) or 5 (b) above. Notwithstanding any agreement between the City and Elster with respect to delivery terms or payment of transportation charges, Elster's standard term for risk of loss or damage shall pass to the City upon delivery to the FOB Elster factory point of shipment/Ex Works delivery point (as defined in INCOTERMS, 2000 edition, published by the International Chamber of Commerce, ICC Publication 560). Notwithstanding the foregoing, title to any software delivered to the City shall remain in Elster, and the City shall receive only a license to use such software pursuant to the terms of the applicable software license agreement between the parties.

11. **Software License Agreement.** The Software License Agreement, Exhibit B, shall govern the licensing and use by City of the Software.

12. **System Maintenance Agreement.** The System Maintenance Agreement (SMA) in Exhibit C shall govern the responsibilities of Elster for software support and maintenance while the SMA is in effect.

13. **Order of Precedence.** In the event of any inconsistencies among the documents, the Software License Agreement shall control with respect to any issues relating to the Software, and the following order of precedence shall apply with respect to any other issues relating to this Agreement:

    a) This Master Agreement
    b) Exhibit A - Statement of Work - Equipment, Services, Software; and Schedule

14. **Assignment.** City and Contractor bind themselves, their successors and assigns to all covenants of this Agreement. This Agreement shall not be assigned or transferred without the prior written approval of City. Contractor shall not hire subcontractors without the prior written approval of City.

15. **Cancellation; Waiver.** Contractor agrees that waiver by City of any one or more of the conditions of performance under this Agreement shall not be construed as waiver(s) of any other condition of performance under this Agreement. Any order release may be cancelled by the City only upon prior written notice and payment of cancellation charges, including but not limited to, all costs identified to the order incurred prior to the effective date of notice of cancellation and all expenses incurred by Elster attributable to the cancellation, plus a fixed sum of ten (10) percent of the final total price to compensate for disruption in scheduling, planned production and other indirect costs. Payment shall be made within 30 days after the date of invoice. The waiver, express or implied, by any party of any of its rights arising under this Agreement, shall not constitute or be deemed an ongoing waiver or a waiver of any other right hereunder, whether of a similar or dissimilar nature.

16. **Severability Clause.** In case any one or more of the provisions in this Agreement shall, for any reason be held invalid, illegal or unenforceable in any respect, it shall not affect the validity of other provisions, which shall remain in full force and effect.

17. **Counterparts.** This Agreement may be executed in one or more counterparts, each of which shall be deemed an original, but all of which shall constitute the same instrument. For the purposes of this Agreement, a facsimile signature shall be deemed an original.

18. **Governing Law and Venue.** This Agreement shall be governed by and construed in accordance with the laws of the State of California, without regard to conflicts of law principles. The venue of any suit filed by either Party shall be vested in the state courts of the County of Santa Clara, or if appropriate, in the United States District Court of California, San Jose, California.

19. **Dispute Resolution.**

    a. Unless otherwise mutually agreed to by the Parties, any controversies between Contractor and City regarding the construction or application of this Agreement, and claims arising out of this Agreement or its breach, shall be submitted to mediation within thirty (30) days of the written request of one Party after the service of that request on the other Party.

    b. The Parties may agree on one mediator. If they cannot agree on one mediator, the Party demanding mediation shall request the Superior Court of Santa Clara County to appoint a mediator. The mediation meeting shall not exceed one day (eight (8) hours). The Parties may agree to extend the time allowed for mediation under this Agreement.

    c. The costs of mediation shall be borne by the Parties equally.

    d. For any contract dispute, mediation under this section is a condition precedent to filing an action in any court. In the event of mediation which arises out of any dispute related to this

Agreement, the Parties shall each pay their respective attorney's fees, expert witness costs and cost of suit, through mediation only. In the event of litigation, the prevailing party shall recover its reasonable costs of suit, expert's fees and attorney's fees.

20. **Independent Contractor.** Contractor and all person(s) employed or contracted with Contractor to furnish labor and/or materials under this Agreement are independent contractors and do not act as agent(s) or employee(s) of City. Contractor has full rights, however to manage its employees, in their performance of Services under this Agreement. Contractor is not authorized to City to any contracts or other obligations.

21. **No Third Party Beneficiary.** This Agreement shall not be construed to be an agreement for the benefit of any third party or parties and no third party or parties shall have any claim or right of action under this Agreement for any cause whatsoever.

22. **Delays.** Neither Party shall be liable for loss, damage, detention or delay nor be deemed to be in default for failure to perform when prevented from doing so by unforeseeable causes beyond its reasonable control, including but not limited to acts of war (declared or undeclared), Acts of God, acts of war or terrorism, fire, strike, labor difficulties, insurrection or riot, embargo or from defects or delays in the performance of its suppliers or subcontractors due to any of the foregoing enumerated causes. In the event of delay due to any such cause, the date of delivery or performance will be extended by period equal to the delay.

23. **Changes.** Any changes requested by City affecting the ordered scope of work must be accepted by Elster and resulting adjustments to affected provisions, including price, schedule, and guarantees mutually agreed in writing prior to implementation of the change. All requested contractual changes shall be in writing between the City Project Manager and the Elster Project Manager when the change impacts project scope or project schedule. Should City request changes to the contract, the City Project Manager and Elster Project Manager will manage and schedule the impacts of those changes as indicated above, including information on cost and scheduling impacts, if any. Changes to the scope requirements will be priced per the unit pricing in Section 5 of the Master Agreement, if applicable or otherwise on request from Elster. Elster may, at its expense, make such changes in the goods and services as it deems necessary, in its sole discretion, to conform the goods and services to the applicable specifications. If the City objects to any such changes, Elster shall be relieved of its obligation to conform to the applicable specifications to the extent that conformance may be affected by such objection.

    Any changes to the system or hardware initiated by City either before or after delivery may necessitate upgrades to third party licenses which may be based on changes in named users, application, number of meters, number of system CPUs or processors, or other criteria and payment for any additional third party license fees will be the responsibility of City unless such costs are specifically noted as included in Elster's Scope of Supply in Exhibit A.

24. **Termination.** Either Party may terminate this Agreement without cause by giving the other Party written notice ("Notice of Termination") which clearly expresses that Party's intent to terminate the Agreement. Notice of Termination shall become effective no less than thirty (30) calendar days after a Party receives such notice. Any order or contract may be terminated by City only by written notice and upon payment of reasonable and proper termination charges, including but not limited to all costs identified to the order or contract which have been incurred up to the date of the notice of termination. Payments shall be made within 30 calendar days from receipt of invoice and acceptance of the goods in accordance with Section 7. Elster may terminate any order for nonpayment. No termination by City for default shall be effective unless, within thirty (30) calendar days after receipt by Elster of City's written notice specifying such default, Elster shall have failed to initiate and pursue with due diligence correction of such specified default.

25. **Hold Harmless/ Indemnification.** To the extent permitted by law, Contractor agrees to protect, defend, hold harmless and indemnify City, its City Council, commissions, officers, and employees, volunteers and agents from and against any claim, injury, liability, loss, cost, and/or expense or damage, including all costs and reasonable attorney's fees in providing a defense to any claim arising therefrom, for which City shall become liable arising from Contractor's negligent, reckless or wrongful acts, errors, or

omissions with respect to or in any way connected with the Services performed by Contractor pursuant to this Agreement.

a) Notwithstanding anything herein, in no event shall either party be liable for special, indirect, incidental or consequential damages, whether in contract, warranty, tort, negligence, strict liability or otherwise, including, but not limited to, loss of profits or revenue, loss of use of the goods or any associated equipment, cost of capital, cost of substitute equipment, facilities or services, downtime costs, delays and claims of customers of the City or other third parties for damages. Contractor's liability for any claim whether in contract, warranty, tort, negligence, strict liability, or otherwise for any loss or damage arising out of, connected with, or resulting from this Agreement or the performance or breach thereof, or from the design, manufacture, sale, delivery, resale, repair, replacement, installation, technical direction of installation, inspection, operation or use of any equipment covered by or furnished under this Agreement, or from any services rendered in connection therewith, shall in no case exceed the amount paid by the City to Contractor at the time the claim is made. This limitation on liability shall not apply to claims for personal injury or death. In no event shall Contractor be liable for any damages, losses, liabilities, costs and expenses (including reasonable attorneys' fees) arising from any improper installation or improper use of any goods by the City or any failure by the City to follow its own safety procedures in connection with the installation or use of the goods.

b) All causes of action against Elster arising out of or relating to this Agreement or the performance or breach hereof shall expire unless brought within one year of the installation of the product to which such claim relates.

26. **Monitoring of Services**. City may monitor the Services performed under this Agreement to determine whether Contractor's operation conforms to City policy and to the terms of this Agreement. City may also monitor the Services to be performed whether financial operations are conducted in accord with applicable City, county, state, and federal requirements. If any action of Contractor constitutes a breach, City may terminate this Agreement pursuant to the provisions described herein.

27. **Responsibility of Contractor**. Contractor shall be responsible for the professional quality, technical accuracy and coordination of the Services furnished by it under this Agreement. Neither City's review, acceptance, nor payments for any of the Services required under this Agreement shall be construed to operate as a waiver of any rights under this Agreement or of any cause of action arising out of the performance of this Agreement and Contractor shall be and remain liable to City in accordance with applicable law for all damages to City caused by Contractor's negligent performance of any of the Services furnished under this Agreement. Any acceptance by City of plans, specifications, construction contract documents, reports, diagrams, maps and other material prepared by Contractor shall not in any respect absolve Contractor from the responsibility Contractor has in accordance with customary standards of good professional practice in compliance with applicable federal, state, county, and/or municipal laws, ordinances, regulations, rules and orders.

28. **Warranties.**

a) Hardware and Services supplied by Elster are to be delivered and warranted in accordance with the following: Contractor expressly warrants that all materials and services covered by this Agreement shall be fit for the purpose intended, shall be free from defect, and shall conform to the specifications, requirements, and instructions upon which this Agreement is based. Contractor agrees to promptly replace or correct any incomplete, inaccurate, or defective Services at no further cost to City when defects are due to the negligence, errors or omissions of Contractor. If Contractor fails to promptly correct or replace materials or services, City may make corrections or replace materials or services and charge Contractor for the cost incurred by City.

Contractor warrants that goods shall be delivered free of defects in material and workmanship and that services shall be performed in a good and workmanlike manner. The warranty

remedy period for goods shall end twelve (12) months after installation or eighteen (18) months after date of shipment, whichever first occurs. The warranty remedy period for services shall end ninety (90) days after the date of completion of services.

If a nonconformity to the foregoing warranty is discovered in the goods or services during the applicable warranty remedy period, as specified above, under normal and proper use and provided the goods have been properly stored, installed, operated and maintained and written notice of such nonconformity is provided to Contractor promptly after such discovery and within the applicable warranty remedy period, Contractor shall, at its option, either (i) repair or replace the nonconforming portion of the goods or re-perform the nonconforming services or (ii) refund the portion of the price applicable to the nonconforming portion of goods or services.

Notwithstanding anything herein, in no event shall Contractor be responsible for gaining access to the goods, disassembly, reassembly or transportation of the goods or parts from or to the place of installation, all of which shall be at City's risk and expense. Contractor shall have no obligation hereunder with respect to any goods which (i) have been improperly repaired or altered; (ii) have been subjected to misuse, negligence or accident; (iii) have been used in a manner contrary to Contractor's instructions; or (iv) are comprised of materials provided by or a design specified by City.

THE FOREGOING WARRANTIES ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES OF QUALITY AND PERFORMANCE, WHETHER WRITTEN, ORAL OR IMPLIED, AND ALL OTHER WARRANTIES INCLUDING ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, NONINFRINGEMENT OR USAGE OF TRADE ARE HEREBY DISCLAIMED. THE REMEDIES STATED HEREIN CONSTITUTE CITY'S EXCLUSIVE REMEDIES AND CONTEACTOR'S ENTIRE LIABILITY FOR ANY BREACH OF WARRANTY.

Notwithstanding the foregoing, goods supplied by Contractor but manufactured by others are warranted only to the extent of the manufacturer's warranty, and only the remedies, if any, provided by the manufacturer will be allowed.

For warranty returns of Elster metering hardware, Elster will pay freight to Elster factory in Raleigh, NC. Elster will provide all freight charges for return of repaired or replaced items from its factory. After the vendor's Warranty period, City is responsible for payment of any support or maintenance agreements for computer hardware and/or customer supplied third party software used in the system.

b) Warranty and other terms for the software will be per the Software License Agreement, Exhibit B.

29. **Confidentiality of Material.** All ideas, memoranda, specifications, plans, manufacturing procedures, data, drawings, descriptions, documents, discussions or other information developed or received by or for Contractor and all other written information submitted to Contractor in connection with the performance of this Agreement shall be held confidential by Contractor and shall not, without the prior written consent of City, be used for any purposes other than the performance of the Services, nor be disclosed to an entity not connected with performance of the Services. Nothing furnished to Contractor which is otherwise known to Contractor or becomes generally known to the related industry shall be deemed confidential.

30. **No Pledging of City's Credit.** Under no circumstances shall Contractor have the authority or power to pledge the credit of City or incur any obligation in the name of City. Contractor shall save and hold harmless the City, its City Council, its officers, employees, boards and commissions for expenses arising out of any unauthorized pledges of City's credit by Contractor under this Agreement.

31. **Use of Name or Emblem.** Contractor shall not use City's name, insignia, or emblem, or distribute any information related to services under this Agreement in any magazine, trade paper, newspaper or other medium without express written consent of City.

32. **Ownership of Material.** All material, including information developed on computer(s), which shall include, but not be limited to, data, sketches, tracings, drawings, plans, diagrams, quantities, estimates, specifications, proposals, tests, maps, calculations, photographs, reports and other material developed, collected, prepared or caused to be prepared exclusively for the City under this Agreement shall be the property of City but Contractor may retain and use copies thereof. City shall not be limited in any way or at any time in its use of said material. However, Contractor shall not be responsible for damages resulting from the use of said material for work other than Project, including, but not limited to, the release of this material to third parties.

33. **Right of City to Inspect Records of Contractor.** City, through its authorized employees, representatives or agents shall have the right during the term of this Agreement and for three (3) years from the date of final payment for goods or services provided under this Agreement, to audit the books and records of Contractor for the purpose of verifying any and all charges made by Contractor in connection with Contractor compensation under this Agreement, including termination of Contractor. Contractor agrees to maintain sufficient books and records in accordance with generally accepted accounting principles to establish the correctness of all charges submitted to City. Any expenses not so recorded shall be disallowed by City. Contractor shall submit to City any and all reports concerning its performance under this Agreement that may be requested by City in writing. Contractor agrees to assist City in meeting City's reporting requirements to the State and other agencies with respect to Contractor's Services hereunder.

34. **Fair Employment.** Contractor shall not discriminate against any employee or applicant for employment because of race, color, creed, national origin, gender, sexual orientation, age, disability, religion, ethnic background, or marital status, in violation of state or federal law.

35. **Insurance Requirements.** During the term of this Agreement, and for any time period set forth in Exhibit E, Contractor shall purchase and maintain in full force and effect, at no cost to City insurance policies with respect to employees and vehicles assigned to the Performance of Services under this Agreement with coverage amounts, required endorsements, certificates of insurance, and coverage verifications as defined in Exhibit E.

36. **Compliance with Ethical Standards.**

Contractor shall:

a. Read Exhibit F, entitled "ETHICAL STANDARDS FOR CONTRACTORS SEEKING TO ENTER INTO AN AGREEMENT WITH THE CITY OF SANTA CLARA, CALIFORNIA"; and,

b. Execute Exhibit G, entitled "AFFIDAVIT OF COMPLIANCE WITH ETHICAL STANDARDS."

37. **Notifications.** All notices to the Parties shall, unless otherwise requested in writing, be sent to and addressed as follows:

To City of Santa Clara SiliconValley Power Attention: Director of Electric Utility 1500 Warburton Avenue Santa Clara, California 95050 JRoukema@svpower.com	To Elster Michelle L. Simmons Contract Services Administrator Elster Solutions, LLC 208 S. Rogers Lane Raleigh, NC 27610 Michelle.simmons@us.elster.com Or by Facsimile at: 919-250-5483

If notice is sent via facsimile, a signed, hard copy of the material shall also be mailed. The workday the facsimile was sent shall control the date notice was deemed given if there is a facsimile machine generated document on the date of transmission. A facsimile transmitted after 1:00 p.m. on a Friday shall be deemed to have been transmitted on the following Monday.

38. **Conflicts of Interests.** This Agreement does not prevent either Party from entering into similar agreements with other parties. To prevent a conflict of interest, Contractor certifies that to the best of its knowledge, no City officer, employee or authorized representative has any financial interest in the business of Contractor and that no person associated with Contractor has any interest, direct or indirect, which could conflict with the faithful performance of this Agreement. Contractor is familiar with the provisions of California Government Code Section 87100 and following, and certifies that it does not know of any facts which would violate these code provisions. Contractor will advise City if a conflict arises.

39. **Export Control.**

a) The City represents and warrants that the goods and services provided hereunder and the "direct products" thereof are intended for civil use only and will not be used, directly or indirectly, for the production of chemical or biological weapons or of precursor chemicals for such weapons, or for any direct or indirect nuclear end use. The City agrees not to disclose, use, export or re-export, directly or indirectly, any information provided by Elster or the "direct product" thereof as defined in the Export Control Regulations of the United States Department of Commerce, except in compliance with such Regulations.

b) If applicable, Elster shall file for a U.S. export license, but only after appropriate documentation for the license application has been provided by the City. The City shall furnish such documentation within a reasonable time after order acceptance. Any delay in obtaining such license shall suspend performance of this Agreement by Elster. If an export license is not granted or, if once granted, is thereafter revoked or modified by the appropriate authorities, this Agreement may be canceled by Elster without liability for damages of any kind resulting from such cancellation. At Elster's request, the City shall provide to Elster a Letter of Assurance and End-User Statement in a form reasonably satisfactory to Elster.

(continued on page 10 of 10)

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40. Resale. If the City resells any of the goods (other than software, which is non-transferable), the sale terms shall limit Elster's liability to the buyer to the same extent that Elster's liability to the City is limited hereunder. In addition, when reselling any of the goods, the City shall maintain strict compliance with the Export Administration Act of 1979, as amended, or any other United States laws and regulations as shall from time to time govern the sale, license and delivery of technology or goods abroad by persons subject to United States law. Resale of goods does not transfer unique LAN identification or software embedded in or related to meters. The buyer of resold goods must contact Elster directly for such components.

IN WITNESS WHEREOF, the parties have authorized their representatives to execute this Agreement effective as of the last date written ("Effective Date").

CITY OF SANTA CLARA, CALIFORNIA
A chartered California municipal corporation

APPROVED AS TO FORM:

ELIZABETH H. SILVER
Interim City Attorney

ATTEST:

RON DIRIDON, JR.
City Clerk

JENNIFER SPARACINO
City Manager
1500 Warburton Avenue
Santa Clara, CA 95050
Telephone : 408-615-2210
Fax : 408-241-6771

ELSTER SOLUTIONS, LLC
a Delaware limited liability corporation

By: H. N. Klett
H. N. KLETT
Title: Vice President, Business Development
Address: 208 S. Rogers Lane
Raleigh, NC 27610
Telephone: (919) 212-4875
Facsimile: (919) 250-5483

EXHIBIT A
STATEMENT OF WORK
EQUIPMENT, IMPLEMENTATION, SERVICES, SOFTWARE AND SCHEDULE

1 Project Overview

The purpose of this Statement of Work (SOW) is to define the work to be completed by all members of the Elster Solutions (ES) project team, which includes 3rd party contractors as approved by City of Santa Clara (herein referred to as CITY) for the successful turn-key implementation of an Elster EnergyAxis Automated Metering Infrastructure (AMI) system as specifically provided herein (the "Project"). This SOW is issued in connection with the Master Agreement between City of Santa Clara, California and Elster Solutions, LLC and is subject to the terms thereof. The following pages are intended to assist all parties in understanding roles and responsibilities, tasks, and Project timelines. Also, this document provides visibility into the interdependencies and inter-relationships required to achieve the desired outcome. Both parties have agreed upon this document and its content.

The goal of the Project is the delivery of a complete Elster 900 MHz EnergyAxis Management System (EA_MS) including meters and a head end server for data collection, and a Tropos wide area communications network (WAN) for deployment throughout the City of Santa Clara, California as further defined in this document. The EA_MS and Tropos Control computer systems shall be installed at CITY's designated premises in Santa Clara for the purpose of operating an Elster EnergyAxis AMI system and a Tropos WAN.

For this project, the scope of deliverables is anticipated to occur over multiple years in multiple phases. The main body of the SOW defines the roles and responsibilities of Elster's and CITY's Project Team, while the itemized deliverables are documented under each deployment phase. The anticipated phases are:

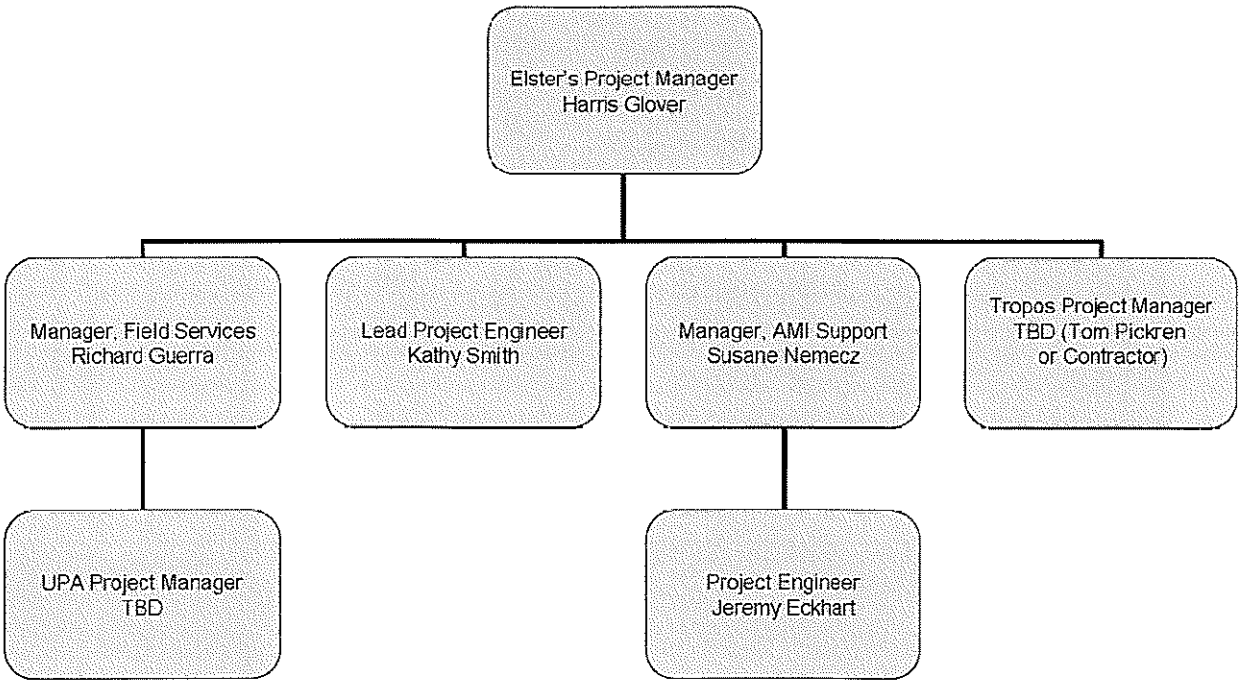
1. Phase 1 Deployment
    a. Implementation of EA_MS
    b. Implementation of WAN
    c. Deployment of meters in a proof of concept area
    d. Establish meter to billing system integration via City Meter Data Management System and Utility Billing System
2. Phase 2 Deployment
    a. Deployment of additional meters
    b. Deployment of other capabilities as requested by CITY
3. Phase 3 Deployment
    a. Deployment of additional meters
    b. Deployment of other capabilities as requested by CITY
4. Phase 4 Reserved
    a. Deployment of additional meters
    b. Deployment of other capabilities as requested by CITY
5. Phase 5 Reserved
    a. Deployment of additional meters

b. Deployment of other capabilities as requested by CITY

2 Project Organization and Procedures

Within 10 working days of the Effective date of the agreement, Elster and CITY shall designate a responsible individual, reasonably acceptable to the other party, as its project manager (the "Elster Project Manager" and the "CITY Project Manager", respectively). Each project manager shall have adequate authority and competence to serve as a project leader and work with the other party with respect to the Project.). CITY shall provide project management for their scope of deliverables as defined herein and to support the operations and maintenance of the EA_MS Server and Gridcom WAN communication network. CITY shall also work with Elster to define the operational procedures and future integration requirements to support eMeter's MDM, billing, work order management and inventory, archiving of data and disaster recovery processes.

The proposed project organization is included below. CITY similarly shall identify key members in support of this implement.



Elster shall provide project management and coordination for its scope of deliverables as defined herein and provide the goods and services in accordance with the final project schedule set out in each deployment phase.

The Elster Project Manager shall function as a part of the overall program management team led by CITY. The Elster Project Manager shall institute specific procedures as required to coordinate activities with CITY and to internally manage the work. This section discusses some of those procedures. These procedures shall be coordinated with the overall program management procedures implemented by CITY.

At the time of the commencement of the Project, an Elster project team shall be formed. The initial task for the project team shall be a Project Planning activity as discussed in Section 3.1 to define and understand mutually acceptable project milestones and deliverables.

The Project procedures to be followed during the course of the Project describe all communications, interface requirements, and means to control the activities between CITY and

Elster project teams. These procedures shall be coordinated with the overall program management procedures implemented by CITY.

2.1 Transmittals and Submittals

The Elster Project Manager shall approve all formal Elster transmittals. CITY and the other parties are requested to implement a similar transmittal policy during the project planning activity, to assure that documents are properly tracked and recorded. This transmittal procedure shall be coordinated with the overall program management procedures implemented by CITY.

2.2 Project Scheduling

Elster utilizes computer-based project scheduling tools to schedule project activities and to track progress. These scheduling tools utilize a Gantt chart network to identify the interdependencies and precedence relationships between project tasks. Project schedules include customer Statement of Work requirements and their dependencies.

The project schedules shall be used by the Elster Project Manager, Project Engineers and AMI Field Services Engineers to plan and control execution of the Elster project scope of supply. These scheduling procedures and the deployment schedules shall be coordinated with the overall program management scheduling implemented by CITY.

The Elster Project Manager is responsible for monitoring progress on the Project schedule, including major milestones associated with contract deliverables.

2.3 Project Control

Elster shall use project control procedures, identified and agreed upon by both parties, during the planning stage, to ensure that project schedules and objectives are accomplished in a timely and effective manner. The control function involves working with the project staff to determine the progress being made, and what problems, if any, are being encountered in the execution of the work. Based on regular reviews, corrective actions shall be taken to prevent or resolve problems. The exact form of these reports will be mutually agreed upon by the CITY and Elster during the Project Planning meeting. Examples of potential reports are project status report, project timeline (MS Project), communication matrix, action register, project delivery report (hardware, meters, etc).

The Elster Project Manager is required to make project reports to CITY based on a weekly schedule. If a project review indicates that progress is not in accordance with plan, corrective actions are required to return the Project to schedule. These reviews help to focus on the most effective course of corrective action, i.e., the course of action that avoids delays in the overall Project schedule and provides critical path mitigation.

Elster shall coordinate all deployment control procedures and reporting functions with the overall program management control procedures implemented by CITY.

2.4 Progress Reports

Progress reports shall be transmitted by Elster to CITY Project Manager based on a mutually agreed schedule.

Included in these reports shall be a narrative including Project metrics, prepared by the Elster Project Manager, which addresses progress and key issues associated with the Project. The contents of the progress report narrative shall include the following:

- Updated project schedule showing project status compared to plan.
- Previous month's progress
- Activities scheduled for the following month
- Problem areas (risks and issues)
- Open action items and status
- Open contractual issues
- System performance metrics
- Deployment production reports

2.5 Requesting Changes to the Project Plan

All requested changes to the Project plan shall be in writing between the CITY Project Manager and the Elster Project Manager when the change impacts Project scope or Project schedule. CITY and Elster shall review all submitted documents within five (5) business days of submittal, as per the transmittal process established during the project planning activity. If no discrepancies are indicated within such time, the document is assumed to be correct and approved. If errors, omissions, or format discrepancies exist, comments indicating the nature of these shall be transmitted by the receiving party to other team's Project Manager.

This documentation review/approval process shall be coordinated with the overall program management control procedures implemented by CITY.

CITY Project Manager and Elster Project Manager shall manage and schedule the impacts of those changes as indicated above, including information on cost and scheduling impacts, if any. Changes to the scope requirements shall be priced per the unit pricing if applicable or otherwise on request from Elster.

2.6 Project Review Meetings

Elster project management approach includes continual customer participation throughout the Project, which shall be necessary to achieve overall project success. Part of this participation includes project review meetings, which shall take place on a mutually agreed to schedule, that shall normally cover a range of topics, including: status and schedule reviews, review of problem areas, coordination of CITY and Elster scope activities, exchange of technical information, and design reviews of future work to be performed by the project teams.

These meetings shall include CITY and Elster personnel and/or their partners as required to address the key issues. To the extent possible, meetings shall be conducted via telephone or video conferencing. The Elster and CITY Project Managers shall mutually agree upon the frequency of these project meetings. The Elster and CITY Project Managers shall also mutually agree to the timing, frequency, and location of any face-to-face meetings. Minutes of the meeting shall be distributed to each project manger's respective leadership.

3 Primary Tasks and Milestones

3.1 Elster Tasks and Responsibilities

Elster shall provide a single point of contact to the CITY to manage Elster's tasks and responsibilities.

3.1.1 Provide Project and Technical Planning and Management

This task includes a two-day on-site meeting, followed by additional meetings as required, to gather site survey data for scope of work development that will including discussion of installation of the Tropos Gridcom server, EA_MS server, network elements, CITY's system interface requirements, field equipment site selection and system deployment for the System Acceptance Test, system operational procedures, and system turnover criteria. This Project and Technical Planning shall result in documents to be reviewed and approved by the CITY including:

a. Finalize Project Plan
   i. Issues management
   ii. Change management
   iii. Risk management
   iv. Communications management
   v. Quality management
   vi. Problem resolution
b. Finalize Project Schedule – A project schedule for each deployment phase shall be jointly developed and mutually agreeable between Elster's and CITY's Project Team. The project schedule shall be included with each deployment phase.
c. Project resource allocation
d. Complete System Planning
   i. Technical architecture
   ii. Data flow
e. Complete Network Planning
   i. Network architecture
f. Finalize Application and Third Party Software List
g. Finalize Implementation Plan
h. Finalize Installation Plan
i. Finalize Meter Recycling Plan
j. Finalize Project, System and Network Report Formats
k. Finalize Test Plan and Related Documentation
l. Finalize Turnover/Transition Plan
m. Provide Project Status Reporting
n. Lead Project Status Meetings

3.1.2 Supplying Equipment

Elster shall provide AMI element hardware as defined in each deployment phase, and as itemized in Exhibit J Elster Confidential Pricing Schedule, including:

a. Tropos radios for WAN communication

b. EA_gatekeepers for AMI network communication

c. Electric AMI meters

d. Water AMI meters

e. EA_Inspector handheld for RF troubleshooting

3.1.3 Provide and Install EA_MS Server Software

Elster shall provide one (1) DVD of the EA_MS software **version 7.x** for system management and meter data collection and supervise the installation and operational verification of the software. During this installation, Elster shall expose available Web Services for the interface with the MDMS.

As part of this installation effort, Elster personnel shall work with CITY personnel to perform an operational checkout of the system and shall configure and verify operation of remote access to the system from the Elster Raleigh, NC office.

Note: if CITY's IT practices require re-installation and reconfiguration of EA_MS software, the additional time shall be billed on a time and material basis.

3.1.4 Provide and Install Tropos Gridcom Server Software

Elster shall provide one (1) DVD of the Tropos Gridcom version 7.3.1.3 software for management of the WAN communication network and supervise the installation and operational verification of the software.

3.1.5 Provide Work Order Management System Support

Elster shall work with the CITY to develop the file format to be used for importing meter exchange data within 48 hours of the installation day. The 48 hours shall be used to conduct or "scrub" the data, which includes QA analysis of photos for meter reading confirmation as well as assurance of proper meter deployment standards. The meter installation data will reside with Elster for up to one year, when it will be transferred to the City for disposition.

3.1.6 Provide EA_MS to MDMS interface support

If the CITY should require functionality enhancements or integration support not supported by the base functionality of eMeter's AMI adaptor, the CITY may engage Elster's Professional Services for these integration services or function enhancements. These efforts will be scoped and a new SOW will be provided for the CITY to review and agree to before the effort would begin. If the CITY desires Elster provide general support and consultative services to the CITY related to the EA_MS to MDMS integration, the CITY may engage Elster Professional Services on a Time and Materials (T&M) basis per the rate schedule included in Exhibit J – Elster Confidential Pricing Schedule.

3.1.7 WAN Network Design

The WAN network design shall provide coverage for the entire CITY based on residential and industrial zones. The CITY service area is approximately 18 square miles with 12 residential and 6 industrial square-mile zones.

Elster shall provide as-built documentation of the WAN network for approval by the City. As-built documentation shall include, at a minimum, network diagram, system architecture, router locations, and performance test results from Tropos Control.

The WAN network shall be designed based on the following criteria:

a. Required site surveys shall be performed by Elster in coordination with CITY to arrive at a mutually agreed design for the mesh network implementation.

b. The network design is planned to utilize the existing City of Santa Clara Enterprise fiber network infrastructure to provide the Capacity Injection Layer for the wireless mesh network as shown in the System Architecture diagram attached hereto and incorporated herein. The Tropos stationary wireless routers (7320/6320 Gateways and Nodes) shall provide the Mesh Access Layer of the network and the Tropos mobile wireless routers (4310 Mobile Node) shall provide the Mobile Mesh Access Layer.

c. Individual virtual wireless networks shall be defined for each City of Santa Clara user community (up to 16), with assigned ESSID, VLAN, IP subnet, and data traffic routing according to City requirements

d. Minimum Required Number of Routers – The General Plan Map obtained from Santa Cara website shows roughly 12 square miles of the City are zoned for Residential, Community Retail, Commercial, Tourist, and Parks & Recreation. The remaining areas of the City are zoned for light/heavy Industrial use. The Tropos mesh network shall be deployed with the appropriate router density based on the anticipated usage of the network in each of the aforementioned zones.

	Router Density	Router Spacing	# Routers
Residential (12 sq miles)	42 routers per sq mile	875 ft	504
Industrial (6 sq miles)	16 routers per sq mile	1418 ft	96
		Total	600

e. Capacity Injection – Minimum Number of Connections to CITY Fiber:.
The minimum nodes to gateway ratio required to achieve the desired performance level is 9 to 1 or 540 nodes and 60 gateways. Gateways need to be evenly distributed across the entire City to achieve the 9 to 1 ratio. CITY shall be responsible for bringing mid-mile connections to the gateway locations and terminating the fiber at the gateway with a media converter. Residential areas shall require 4 gateways per square mile and industrial areas 2 gateways per square mile. Therefore, in anticipation that the highest traffic demands will be in the residential, non-industrial areas, the Gateways will be deployed accordingly.

	Capacity Injection	# Gateways
Residential (12 sq miles)	4 Gateways per sq mile	48
Industrial (6 sq miles)	2 Gateways per sq mile	12
	Total:	60

f. A Network Design Document shall be delivered for the project within 60 days of contract execution for the CITY to review, approve and issue notice to proceed.

g. The design shall utilize the City fiber optic maps where feasible for selecting Gateway locations, but should assume fiber will be extended or a point to point or multi point microwave will be installed for capacity injection if needed to meet performance requirements. Where feasible, Elster shall work with the CITY to prioritize existing fiber access locations in defining where to site the WAN gateways.

h. The Gateway to Node ratio design is not to exceed ten (10) Nodes per Gateway.

i. A city wide Design based on asset locations shall be developed using Google Earth. The design shall plan for the total number of radios required for the network reflecting

Residential and Industrial areas. The visual design shall show router spacing, density and highlight gateway and node locations.

j. The network design requirement for hops from nodes to gateway is that ninety percent (90%) of the Nodes will meet the three hop criteria with a fourth hop allowed for ten percent (10%) of the Nodes. Throughput service level agreements shall be met as established in the Appendix J-1 of Exhibit J.

k. A mutual design review shall be completed and accepted before network deployment begins.

3.1.8 Test Proof of Concept (POC) Area

A POC will be conducted to test the WAN network performance and coverage and shall include:

a. A 42 router (1 square mile) POC with 4 mid-mile connections will be deployed in a residential area.

b. A 16 router (1 square mile) POC with 2 mid-mile connections will be deployed in an Industrial area.

c. Elster shall provide Tropos Control reports to show mesh performance results of 3Mbps bi-directional performance between routers for at least 95% of the routers deployed.

d. Elster shall also provide a coverage map based on street centerlines on the POC areas using Tropos Drive.

e. Elster shall test end-to-end throughput of the entire POC consisting of 58 routers.

- Test points are identified by a street intersection or address identifier and latitude/longitude for repeatability
- Test points shall be on a sidewalk next to a paved road within the coverage area
- Test points shall be within 200 feet of the nearest Tropos router and not obstructed by buildings, trees or other obstacles
- One test notebook PC will be used for this purpose with an off-the-shelf internal Wi-Fi chip (50 mW)
- The test notebook PC will be free of viruses and other performance-impacting software including encryption and will be reserved for this purpose. Tropos engineers will verify that the laptop configuration is correct.
- The test shall be performed to an Ookla or equivalent server residing on the City network
- Throughput to the laptop will be at least 1.5 Mbps for 95% of the 58 fixed test points
- Three data transfer tests will be performed for each point and at least one test must achieve the throughput requirement
- Tests with unusually high noise (2.4 GHz noise level exceeding -90 dBm) will be discarded. Discarded tests shall not exceed 10% of total number of tests.

f. Elster shall provide testing results to CITY to for signature to pass the design criteria. Once signed, performance and coverage testing will be deemed sufficient for the City wide deployment. Elster shall provide mesh performance results for the City wide network using Tropos Control and Tropos Drive. CITY shall be allowed to select additional 5% of the routers for detailed throughput and data transfer testing to evaluate performance to stated service levels.

WAN Throughput and performance:

a. Peak Performance for Wireless Mesh Network

- 95% of routers in the network shall be capable of delivering a minimum of three (3) Mbps bi-directional peak throughput performance.
- Peak performance is defined as measuring maximum throughput testing to a single router at any location within the network.
- Throughput will generally be tested through the Tropos NUTT test. The Tropos NUTT test results will be validated by ten (10) independent throughput tests to a server connected to the core or hub network. Once the Tropos NUTT test is validated, the NUTT test will serve as the metric for backhaul network performance.

b. Simultaneous Network Throughput Performance

- Every Access Point in the network shall be capable of delivering a minimum of one (1) Mbps bi-directional simultaneous throughput performance.
- The simultaneous throughput performance shall be tested initially through a simultaneous test to up to ten (10) AP's behind a single Gateway. The simultaneous throughput of every AP must reach a minimum of one (1) Mbps.
- Multiple Gateway or a network wide maximum throughput test should be completed for disaster recovery, however as the deployment is expected to be staged and the backhaul capacity is also a gating factor for the network, the only initial usable performance metric for simultaneous throughput is on a per Gateway basis.
- Tropos NUTT Tests or IPERF equivalent tests will be used and accepted.

WAN Network Availability:

a. Network Availability is measured by a Network Monitoring System (NMS) which will utilize PING or an SNMP poll of the network to measure availability continuously over a 24 hour period. The NMS is not yet defined for the project and may be provided by either Vendor or City resources, to be determined.
b. Core Network Availability is required to be one hundred per cent available (100%) over a forty eight (48) hour period to support the wireless mesh network testing and injection layer is required to be ninety nine point nine (99.99%). The Core and Injection Layer are both city provided and managed networks.
c. The Network Availability requirement for the wireless mesh network is ninety nine point nine nine percent (99.99%) available over a forty eight 48 hour period for the wireless mesh network. CITY and Tropos will test when the wireless mesh network is fully deployed. Tropos Control can provide stats and reports for the wireless mesh network to CITY.

Additionally, the AMI network gatekeepers as well as electric and water elements shall be deployed in the POC area for verification of the installation process and the IT data transfer between the CITY's CIS and the installation WOMS.

3.1.9 Install AMI Electric and Water Element Hardware

Elster shall install the AMI electric and water elements. The installers shall be trained installation technicians meeting the safety guidelines of CITY. The installers shall have uniformed vehicles as well as uniforms and ID badges. Installation services include placing door hangers, 24/7 Call Center, properly sized and equipped cross-dock and warehouse, and provide storage of removed equipment for up to 30 days

Installation of electric elements shall include:

a. Visual inspections for diversion, hazardous conditions or meter tampering
b. Voltages taken at all sites to identify maintenance issues, confirm correct meter forms and identify thefts
c. Confirming of meter location and address
d. Ruggedized handhelds with Work Order Management for automated data processing
e. Production reports that include completed, skipped, return to utility, and customer issues
f. Data scrubbing and validation before uploading to CIS system
g. Web-based tool to monitor daily status with user ID and password
h. Medical alert awareness
i. Sealing strategy awareness
j. Capturing GPS coordinates in decimal degrees to the 5th decimal
k. Taking digital images of as-found and as-left
l. Inventory management and control
m. Site clean up

Installation of water elements shall include:

a. Visual inspections for diversion, hazardous conditions or meter tampering
b. Confirming of meter location and address
c. Ruggedized handhelds with Work Order Management for automated data processing
d. Production reports that include completed, skipped, return to utility, and customer issues
e. Data scrubbing and validation before uploading to CIS system
f. Web-based tool to monitor daily status with user ID and password
g. Sealing or locking strategy awareness
h. Cleaning and preparing pit
i. Capturing GPS coordinates in decimal degrees to the 5th decimal
j. Taking digital images of as-found and as-left
k. Inventory management and control
l. Site clean up

3.1.10 Provide Additional Systems Integration/Interface Planning Support

The Elster scope for IT and EA_MS systems integration currently includes only the provision of the Elster standard XML data output files from the EA_MS system and the standard Web Services available for interfacing to other enterprise applications. The goal will be to understand the input and output capabilities of the EA_MS system and how those could be integrated with CITY operational systems and processes such as the eMeter's MDMS. No actual integration work is anticipated to be performed by Elster. If CITY desires for consulting and integration services beyond what Elster can provide as stated above, Elster will produce a new SOW for this

effort. This new SOW will be submitted to CITY for consideration and will go through the review process set forth in this agreement.

3.1.11 Perform System Testing

Elster shall assist in the development of System Acceptance Test (SAT) procedures and SAT criteria. A 30 day System Acceptance Test shall start upon the installation of the AMI server and the initial AMI network elements. Elster shall support the SAT via personnel located on site during the testing or alternately via its support connection from the Factory which shall be made available during SAT testing. The SAT shall continue and shall only be deemed to be complete upon issuance of a System Acceptance Test certificate duly executed by the CITY Project Manager indicating that acceptance testing has been successfully completed which issuance shall not be unreasonably withheld or unduly delayed.

3.1.12 Provide System Training

Elster shall provide four days of on-site Training for CITY personnel on the initial system hardware and EA_MS software. Elster has developed a standard curriculum for training of Software Users, System Administrators, and Installers on system hardware, AMI system theory, and EA_MS system operation. Topics include:

- EA_MS system administration and configuration
- EA_MS user interfaces and functionality
- Use of Elster Element Data Marriage Files (Marriage files are manufacturing files sent with each meter shipment that include REX meter serial numbers, RF LAN ids, etc. for batch loading into the EA_MS system.)
- Data import and export
- AMI System operation, AMI elements, and A3 ALPHA Gatekeepers

The initial training shall be designed to permit the employees receiving such training to train other employees of CITY, using the training manuals and procedures prepared and utilized by Elster. CITY may videotape training sessions for exclusive use by CITY. CITY shall not disclose such videos to third parties without Elster's written permission.

Elster shall provide preconfigured AMI elements for training purposes. Elster shall ship these training elements to CITY; the logistics of this set-up shall be discussed and mutually agreed to prior to the training date.

Training on the Tropos Gridcom solution shall be held at Tropos' facility for two (2) persons on their regularly scheduled training session. Training topics to include:

- Deploying Tropos mesh networks
- Troubleshooting Tropos mesh networks
- Managing Tropos mesh networks
- Advanced Tropos mesh configuration

3.1.13 Provide System/Network Operation Support

Elster shall provide engineering consultation as necessary during the Project. Consultation shall be from the Elster factory, or on-site at CITY if requested, assuming CITY payment of travel

and living expenses. Elster and CITY shall agree upon on-site work for which travel is to be reimbursed, but this shall in general include system planning, System Acceptance Testing definition, on-site project management meetings, training, management of the installation services, and SAT support. Any additional travel and living expenses are subject to approval by CITY. Software support is contingent upon Elster being provided a high-speed LAN connection for monitoring of the EA_MS Server located at CITY. Elster Support requires direct access to the A3 ALPHA Gatekeepers for technical support and/or system analysis. CITY must provide access to these devices via the same VPN mentioned above or via a separate VPN. Elster agrees to treat any metering or customer information as proprietary and confidential to CITY.

3.1.14 Provide Help Desk Support

Elster's help desk support is available depending on the support level selected by CITY. The support level options are described in the Software Maintenance Agreement. Elster shall provide the toll-free telephone number along with the access code to CITY at the conclusion of the training session.

3.1.15 Provide System Reports

Elster shall identify and provide available reports that are suitable for monitoring the service performance levels. The set of reports will be derived from the available reports in EA_MS. Examples include:

a. Meter Communications Report - This report provides information about EA_MS-to-meter communication sessions, times, etc.

b. LAN Information Report - This report provides a table of information about each node's path, its number of descendants, number of repeater descendants, node levels, most recent communication performance etc

c. Schedule Performance Report – This report provides the performance statistics for each execution of the schedule.

d. Network Capacity Report – This report provides an indication of how loaded the 900 MHz LAN is, and how gatekeepers are configured in terms of memory allocation amongst short format nodes, long format nodes, interval data entries, one-way nodes, etc. The information provided can be used in determining gatekeeper placement and configuration as well as node meter configuration to ensure network efficiency.

3.2 CITY Tasks and Responsibilities

3.2.1 Provide Appropriate City Project Resources

CITY shall designate a Project Manager to manage the CITY's tasks and be a single point of contact to Elster's Project Manager.

3.2.2 Provide Project Management

CITY Project Manager shall coordinate and manage all of the CITY's tasks outlined under this Section 3.2 and have the authority to sign-off on completed deliverables and milestones.

CITY shall take part in the Project Planning effort by staffing the process with the appropriate personnel. This would include participation by the CITY Project Manager, Metering and Field Customer Services, Meter Reading, Billing, Customer Service, Technology Services and IT personnel.

3.2.3 Order Tropos Network Equipment

CITY shall issue a purchase order for the Tropos WAN network equipment for delivery prior to December 31, 2010.

3.2.4 Provide Computer Hardware, IT Infrastructure and Related Support

CITY shall supply the computer hardware for the Elster's EA_MS server and Tropos' Gridcom server.

The recommended hardware for the Elster's EA_MS is provided below for the production, backup and test server.

Production Server

Product Description / Link	MFG Part #	CDW Part #	Qty
IBM System x3550 M3 7944 - Xeon X5650 2.66 GHz	7944E3U	2081274	2
IBM memory - 4 GB - DIMM 240-pin - DDR3	49Y1435	2039545	16
IBM hard drive - 500 GB - SAS	42D0707	1833214	8
IBM power supply - hot-plug / redundant - 1.1 kW	49Y7342	2195882	2
HP DVD-ROM drive - IDE			2
64 Bit OS Microsoft Windows Server 2008 Enterprise - license and media R1, SP2	P72-02977	1429540	2
Microsoft Windows Server User CAL 2008 - license	R18-02804	1416709	10

Backup Server

Product Description / Link	MFG Part #	CDW Part #	Qty
IBM System x3550 M3 7944 - Xeon X5650 2.66 GHz	7944E3U	2081274	2
IBM memory - 4 GB - DIMM 240-pin - DDR3	49Y1435	2039545	16
IBM hard drive - 500 GB - SAS	42D0707	1833214	8
IBM power supply - hot-plug / redundant - 1.1 kW	49Y7342	2195882	2
HP DVD-ROM drive - IDE			2
64 Bit OS Microsoft Windows Server 2008 Enterprise - license and media R1, SP2	P72-02977	1429540	2
Microsoft Windows Server User CAL 2008 - license	R18-02804	1416709	10

Test Server

Product Description / Link	MFG Part #	CDW Part #	Qty
IBM System x3550 M3 7944 - Xeon X5650 2.66 GHz	7944E3U	2081274	2
IBM memory - 4 GB - DIMM 240-pin - DDR3	49Y1435	2039545	16
IBM hard drive - 500 GB - SAS	42D0707	1833214	8
IBM power supply - hot-plug / redundant - 1.1 kW	49Y7342	2195882	2
HP DVD-ROM drive - IDE			2
64 Bit OS Microsoft Windows Server 2008 Enterprise - license and media R1, SP2	P72-02977	1429540	2
Microsoft Windows Server User CAL 2008 - license	R18-02804	1416709	10

The recommended hardware for the Tropos' Gridcom is provided below.

Product Description	MFG Part #	CDW Part #	Qty
IBM Server - blade - 2-way - 1 x Xeon X5570 / 2.93 GHz - RAM 4 GB - SAS - hot-swap 2.5" - no HDD - ATI ES1000 - Gigabit Ethernet - no OS - Monitor : none	7870C4U	1721135	1
IBM Hard drive - 500 GB - hot-swap - 2.5" SFF Slim - SATA-300 - 7200 rpm	42D0752	1829853	2

Additionally, CITY shall supply all information technology infrastructures including:

a. Facilities suitable for all EA_MS Server hardware, including proper environmental conditioning, power and surge protection

b. Physical installation of Server hardware

c. Any hardware located in the City of Santa Clara that is required to support remote access to the EA_MS system by Elster and Tropos' Gridcom system by Tropos. City will provide VPN tokens for use by Elster and Tropos.

d. IT Integration – any system that will share information through defined interfaces such as a CIS and MDMS operated by the CITY

e. IP connections - to systems that are required for integration stated above and to the deployed EA Gatekeepers.

f. Backup and other required support processes – as defined by the CITY that Elster's EA_MS system will have to participate.

CITY shall provide on-going IT hardware support for the Elster's EA_MS and Tropos' Gridcom systems after installation. CITY support includes all hardware and software supports other than the EA_MS software supported by Elster or Gridcom software supported by Tropos as a part of the Software Maintenance Agreement.

CITY shall provide communication services including a high-speed VPN connection for use by Elster and Tropos for system support. CITY shall supply a Cisco two factor VPN. Changes shall be mutually approved by both parties in advance.

3.2.5 Support Meter Reading

Reading of the meters for billing shall be handled by existing CITY meter reading processes until such time as suitable systems integration is in place to process files and data from the AMI system as agreed to in the Project Plan.

3.2.6 Obtain Permits

CITY shall provide personnel and resources to manage and coordinate the work order and permitting process while Elster shall provide necessary data and support.

3.2.7 Provide EA_MS Meter Definitions

CITY operators shall perform the required setup of meters in the EA_MS system (meter id, account, schedules, Gatekeeper parameters, etc.). Sufficient information shall be provided in the user training to allow this function to be performed. Depending on CITY's operational preferences, bulk operations can be implemented to facilitate this process, such as importing the factory meter "Marriage Files" and EA_MS "CIS Import" functionality. These operations shall also be addressed during training.

CITY shall operate the EA_MS system after installation by Elster to obtain meter readings, monitor AMI system performance, etc. Should CITY want to verify consistency of meter

readings with manual reads, EA_MS provides reports of consumption meter readings that can be used to correlate with the manual meter readings each month. Note that the remote reading times will not correspond exactly to the manual meter reading times, so exact matches of consumption values are not to be expected.

3.2.8 Install WAN and AMI network hardware

CITY shall be responsible for the installation of WAN and AMI network hardware including the WAN radios and AMI gatekeepers.

Installation of Tropos WAN elements shall include:

a. Tropos radios on CITY's owned power poles and street lights with available AC power supplies

b. Other CITY's facilities – such as water towers, CITY buildings, communication towers, and other structures with available AC power – that are suitable for such installation may be considered.

c. CITY shall provide the bucket truck crew and physical installation on the mounting asset as well as traffic control compliance. Elster shall assist the CITY with the application process for obtaining the necessary permits.

d. CITY shall be responsible for bringing mid-mile connections to the gateway locations and terminating the fiber at the gateway with a media converter.

e. CITY shall install Ethernet cable from the Tropos radios to the EA_gatekeepers.

Installation of Non-meter Gatekeeper with battery back-up on available distribution poles shall include:

a. Gatekeepers shall be mounted approximately eight-foot (8') level using Uni-Strut and heavy duty hardware

b. A solid disconnect is wired ahead of the Gatekeeper to isolate power to the switch when maintenance is required.

c. All devices shall be grounded to pole ground or an 8 foot ground rod will be set at the base of the distribution pole.

d. All conduit connections shall be weather tight and exit the bottom of the Gatekeeper only.

e. A ¾" riser with weather head will be installed to the line side of the switch with 18" pigtails and clamps every 36 inches

f. CITY will connect the pigtails to their secondary service on the pole

g. Elster will program and commission the Gatekeeper to the appropriate IP address

h. CITY will provide locks to secure Gatekeepers and solid disconnects once commissioned

i. CITY will provide any specialty labeling to be placed on enclosure lid.

3.2.9 Provide Specific Communication Lines

CITY shall be responsible for installation and operation of all mid-mile injection points to the Tropos WAN communication network. Sufficient injection capacity shall be installed to ensure adequate throughput to support the collection of AMI data and for future system expansion.

CITY shall install Surge protection, where needed, to avoid potential equipment damage if lightning or surges. Elster shall assist CITY in recommending surge protection equipment provided that CITY shall have no obligation to purchase such equipment. CITY's responsibilities shall include:

a. Provide mounting assets and electric power.
b. Provide electrical grounding of Tropos Routers as required.
c. Provide fiber network staff to perform fiber network configuration and testing for network implementation based on a mutually agreed design.
d. Provide fiber media conversion with Dmarc at Tropos gateway router locations.
e. Provide IT assistance to install Tropos Control/Insight management software on City server.
f. Provide Internet access / connectivity, DNS, and DHCP network services via existing network infrastructure as required for network and application testing.
g. Provide Subscriber Management server and software if needed.
h. Provide installation, mounting arms, cabling and electrical work as needed for water towers, communications towers and building rooftop mounted Tropos Gateways. (Elster assumes the base implementation will be street lights with photo cells)

3.2.10 Provide WAN Implementation Support

CITY shall be responsible for the following:

a. CITY shall provide warehouse facility for storage of the WAN network equipment from its delivery until the installation process commences when Elster establishes the cross-dock facility.
b. CITY shall perform necessary configuration modifications and testing of the City's existing wired Enterprise network infrastructure in accordance with the mutually agreed network design. These configuration changes include:
    - Defining and administering network security policy which the network project implementation shall adhere to.
    - Enabling Ethernet VLAN trunk ports (802.1x) for Tropos Gateway connections.
    - Allocating required IP Address subnets.
    - Implementing wired router configuration changes as needed.
    - Configuring DHCP server to provide reservations for designated IP device interfaces.
    - Implementing Firewall configuration changes as needed to facilitate application testing.
    - SSID VLAN map
    - Security - radius
c. CITY will inject backbone network capacity for the WAN network by providing a mid-mile connection for the Tropos Gateway locations using the CITY fiber optic network, providing up to one (1) Gigabit of real capacity for the network at every fiber connected location. CITY shall be responsible for providing the mid-mile connection to the Tropos gateway locations identified in the mutually agreed Network Design document. CITY will provide the media converter and terminate at the installed Tropos router location. CITY must meet the project schedule dates to keep project on schedule.
d. Alternative capacity injections to off fiber network locations may be delivered using point to point microwave radios or other technologies for Gateway locations. All alternative injection locations will deliver a minimum of ten (10) Megabits per Second (Mbps) to each Gateway location. CITY shall be responsible for all wireless capacity injection should it be utilized.

e. The CITY provided fiber backhaul capacity injection will provide the wireless mesh network Gateway radios with the necessary capacity to maximize both peak and simultaneous performance for the wireless mesh network and meet all design and deployment throughput requirements. The network will be deployed with 600 routers. The throughput requirement to every router in the network is one (1) Mbps so six hundred (600) Mbps total capacity for the network will support one (1) Mbps of backhaul throughput to every router.
f. CITY shall provide mid-mile connections in a timely fashion in order to meet the project schedule to selected Tropos routers as defined by a mutually agreed to Wireless Network Design.
g. CITY will provide all necessary fiber optic media conversion equipment
h. CITY shall provide Tropos GIS layers that can be imported into a GIS system that supports ESRI shape file data interchange format, These files shall include all assets where routers can be installed including:
    - Traffic and Street Lights
    - Utility Poles
    - Buildings
    - Water and Communication towers
    - Other City known locations or assets
        - Tropos assumes all connections to street lights will be via photo cell. Other connections may require the use of an electrician and necessitate a change order for the additional costs.
        - CITY is responsible for acceptable mounting assets on the other sites.

3.2.11 Provide On-site Work Space and Training Space

CITY will provide office or work space for Elster's personnel when they are on-site. This consists of office furniture, office telephone, computer internet connections, and access to a printer/copier and access to a conference room.

Subject to logistical constraints, CITY shall provide to the best of its ability suitable facilities for the EA_MS training. This includes:

- Access (Elster to define) to the EA_MS server for the administrative portions of the training
- PC workstations with web access to the EA_MS Server for the user interface portions of the training.
- Access to AMI elements and A3 ALPHA Gatekeepers for the element portions of the training as well as EA_MS user training.

3.2.12 Provide System Interface Support for meter deployment

CITY shall provide a complete download of the CIS file with all available information and black out dates so Elster can develop their WOMS for route scheduling. CITY shall provide a fresh CIS data download on a weekly basis. CITY shall omit any meter sites that are not intended to be completed by Elster. Any site that is included in the refresh file and found to be completed shall be tagged as Found Complete "FC" and will be charged as a completed account.

CITY shall anticipate providing installation services at few locations where Elster is unable to complete due to inability to access or problems with the meter sockets.

CITY shall be responsible for input of metering data from the system or meters into the eMeter's MDMS by either directly using the Elster standard AMRDEF XML file structure or converting these files to alternate file formats as needed.

For this SOW, only analysis and planning for the future integration shall take place.

3.2.13 Provide Support to the System Acceptance Testing

CITY shall assist in the development of SAT procedures and System Acceptance Test Criteria. CITY shall perform the SAT testing per the mutually developed SAT Test Plan. Elster shall support and assist. Recommended SAT procedures and criteria are provided in Section 4. Some SAT functionality may require special equipment or meters rather than field equipment for functions like demand reset, disconnect, etc. This shall be discussed and mutually agreed during the project planning activity and any such equipment shall be supplied by CITY at its cost.

3.2.14 Deliverable Review and Approval and Notification of Milestones Completion

CITY Project Manager shall review and approve Elster's tasks and deliverables. CITY Project Manager shall provide notification of milestone completion within five (5) business day of document transmittal or deliverables. If no discrepancies are indicated within such time, the document or deliverable is assumed to be correct and approved.

3.2.15 Payment of Invoices

CITY shall be responsible for payment of invoices when they are due.

4 System Acceptance Test Plan and Service Level

4.1 System Acceptance Test Plan

The system acceptance test procedures and criteria shall be finalized between Elster and CITY during the project planning activity. A list of possible system acceptance procedures is provided below:

a. Retrieval of register data from electric and water elements

b. Retrieval of interval data from electric and water elements

c. Retrieval of TOU register data from electric elements

d. Performing on-request read of electric and water elements

e. Performing demand reset on electric elements

f. Performing disconnect and re-connect commands. This test procedure has direct impact on the customers and shall be conducted in a laboratory setup.

g. Register and load profile data received by eMeter's MDM. This test procedure requires the completion of the integration between EA_MS and eMeter's MDM and the support of CITY and eMeter on this effort.

4.2 Service Level

Elster and CITY shall agree of a set of service level performance for the network. The service levels are described in the Appendix J-1 of Exhibit J.

5 System Turnover

The system turnover date shall occur thirty (30) days after the System Acceptance Test has been conducted and accepted by the CITY.

When the system is turnover to the CITY, on-going support is covered under the terms of the Software Maintenance Agreement.

6 Deliverables

6.1 Implementation Phase 1 - Deployment

Deliverable Set 1:

- Project Plan per Project Management Institute Standards including:
  - Risk Management Plan
  - Communication Management Plan
  - Issue Tracking Plan
  - Change Control Plan
  - Quality Management Plan
  - Problem Resolution Plan
- Project Schedule
- Staffing and Resource Requirement Plan

Deliverable Set 2

- Technical Architecture Diagram
- Network Architecture Diagram
- Data Flow Diagram
- Application and Third Party Software List
- Implementation Plan
- Meter Installation Plan
- Electric and Water Meter Recycling Plan
- System and Network Documentation (including reports, functions, features, security, system administration information, etc.)

Deliverable Set 3

- User/Training Documentation (including Training Manual, Training Materials, Help Guide, etc)
- Training Plan
- Test Plan
- System Turnover/Transition Plan

Other Implementation Deliverables

- Training Results Documentation
- Testing Results Documentation
  - Field Proof of Concept Test Results

- Final Test Results

6.2 Operational and Maintenance Phase Deliverables

- Operations and Maintenance Support Plan
- Monthly Reports
- Invoices
- Final Turnover/Transition Plan
- Turnover/Transition Plan Results

7 Invoice and Payment Milestones

Six payment milestones have been identified and agreed to for this SOW and are included herein:

Milestone	Descriptions	Payment milestone
1	a. Delivery of WAN network equipment b. Commencing the WAN network design	Yes
2	a. Deliverable Set 1 - Final Project Plan b. Deliverable Set 2 - Completion of AMI network design c. Deliverable Set 2 - Completion of WAN network Design	Yes
3	a. Delivery of AMI network equipment and AMI elements b. Software license for AMI network c. Software license for WAN network	Yes
4	a. Installation and verification of AMI server b. Installation and verification of WAN server c. Verification of the IT integration of the register and load d. profile data between EA_MS and eMeter's MDMS per eMeter interface specification d. Proof-of-Concept deployment of the WAN network e. CIS/WOMS integration f. AMI Lab POC – installed g. AMI Lab POC - testing	Yes
5	a. Installation of electric and water elements and as-found testing in the POC areas b. On-site Training on EA_MS c. Deliverable Set 3 - Training documentation, System Acceptance Testing, and System Turnover/Transition plan. d. AMI POC areas – Network operation e. AMI POC areas – System operation f. AMI POC areas – SAT testing	Yes
6	a. Complete installation of remaining WAN network elements b. Installation of electric and water elements and as-found testing	Yes

Phase 1 of this SOW consists of all six milestones outlined above.

Subsequent deployment phases consist of the installation of electric and water elements where only milestone "6b" is applicable. During these phases, invoices for the equipment hardware shall be issued when the equipment is shipped from Elster, and invoices for the installation services shall be issued for the complete installs on a bi-weekly basis.

Software maintenance fee shall be invoiced annually.

Travel and expenses are invoiced at cost plus 10% administrative fee.

All undisputed invoices shall be processed by the CITY with a net 30-day payment term.

8 Pricing

Pricing schedule shall be included with each deployment phase. Applicable sales tax shall apply to equipment hardware, software license fee and software maintenance fee. Presently, sales tax does not apply to professional or installation services. Should the sales tax change, applicable rate shall apply accordingly.

The unit pricing for the installation services assumes the following:

- There is no prevailing wage or union requirements associated with the installation of the AMI endpoints and network equipment.
- Fuel price of $3.00 per gallon. In the event the fuel costs exceed $3.50 per gallon during this project, a fuel surcharge based on existing fuel prices shall apply.
- Subject to a 3% cost of living increase if applicable.

9 Glossary

AMI – Advanced Metering Infrastructure

AP – Access point

CIS – Customer Information System

DHCP – Dynamic Host Configuration Protocol is an auto-configuration protocol used on IP networks

DNS – Domain Name System

EA_MS – EnergyAxis Management System

EMS – Tropos Control will act as the Element Management System for the Tropos mesh.

IP – Internet Protocol

iPERF – An alternative to NUTTCP for measuring maximum TCP and UDP bandwidth performance. iPERF allows the tuning of various parameters and UDP characteristics. iPERF reports bandwidth, delay jitter, datagram loss. iPERF is not integrated with Tropos Control, but, can be used to validate the numbers reported by Tropos Control.

LAN – Local Area Network

Mbps – Megabit per second

MDM/MDMS – Meter Data Management or Meter Data Management System

MHz – Mega Hertz

NMS – Network Monitoring System

NUTTCP – A network performance measurement tool intended for use by network and system managers. Its most basic usage is to determine the raw TCP (or UDP) network layer throughput by transferring memory buffers from a source system across an interconnecting network to a destination system, either transferring data for a specified time interval, or alternatively transferring a specified number of bytes. Tropos Control uses automated NUTTCP tests to

generate performance metrics on the network. Manual NUTTCP tests can also be run from Tropos Control, and/or from a CLI interface on the Tropos mesh routers.

POC – Proof of Concept

RF – Radio Frequency

SAT – System Acceptance Test

SNMP – Simple Network Management Protocol

SSID -- Service set identifier is a name that identifies a particular 802.11 wireless LAN

TOU – Time-of-use

VLAN – Virtual Local Area Network

VPN – Virtual Private Network

WAN – Wide Area Network

WOMS – Work Order Management System

XML – Extensible Markup Language is a set of rules for encoding documents in machine-readable form

PHASE 1 DEPLOYMENT

A. Project Schedule

Elster and CITY shall finalize the project schedule at the Project and Technical Planning Meeting.

B. Pricing Schedule

Milestone	Descriptions	Payment milestone
1	a. Delivery of WAN network equipment b. Commencing the WAN network design	$ 1,080,192.00
2	a. Deliverable Set 1 - Final Project Plan b. Deliverable Set 2 - Completion of AMI network design c. Deliverable Set 2 - Completion of WAN network Design	$ 244,475.00
3	a. Delivery of AMI network equipment and AMI elements b. Software license for AMI network c. Software license for WAN network	$ 310,427.50
4	a. Installation and verification of AMI server b. Installation and verification of WAN server c. Verification of the IT integration of the register and load profile data between EA_MS and eMeter's MDMS per eMeter interface specification d. WAN Proof-of-Concept deployment and SAT testing e. CIS/WOMS integration f. AMI Lab POC - installed g. AMI Lab POC - testing	$ 263,035.00
5	a. Installation of electric and water elements and as-found testing in WAN POC areas b. On-site Training on EA_MS c. Deliverable Set 3 - Traing documentation, System Acceptance Testing, and System Turnover/Transition plan. d. AMI POC areas - Network operation support e. AMI POC areas - System operation support f. AMI POC areas - SAT testing	$ 154,640.30
6	a. Complete installation of remaining WAN network elements b. Installation of additional electric and water elements and as-found testing	$ 186,875.00
7	Travel and Expense (estimated)	$ 38,406.00
8	Sales Tax	$ 111,346.37
	TOTAL PHASE 1	$ 2,389,397.17

Note: Itemized unit pricing is described in Exhibit J, Confidential Pricing Schedule

C. WAN Network Responsibility Matrix

The responsibility matrix for the design and implementation of the WAN communication network in Phase 1 Deployment is provided herein.

#	ACTIVITY	CITY	ELSTER
1	Project prime contractor		✓
2	Wireless project management		✓
3	Network design	✓ (Participate and Approve)	✓ (Propose)
4	Tropos system engineering (on-site and remote)		✓
5	Site survey of mounting assets	✓ (Participate)	✓
6	Obtain mounting asset rights	✓	
7	Create mounting database and plan		✓
8	Provide storage facility for the Tropos radio until Elster establish the cross-dock facility.	✓	
9	Provide Tropos routers and professional services		✓
10	Stage and Configure Tropos routers		✓
11	Provide server for management software	✓	
12	Install mgmt software and configure		✓
13	Provide fiber and/or wireless capacity injection	✓	
14	Provide and connect fiber media converter	✓	
15	Provide internet connectivity and gateway	✓	
16	Create client landing web page	✓	
17	Provide user authentication	✓	
18	Create Service Work Orders for Install Crews		✓
19	Provide installation crews and bucket trucks	✓	
20	Supervise Tropos router installation		✓
21	Provide cabling/conduit for building gateways	✓	
22	Configure network elements and connections	✓ (Existing City Owned)	✓
23	Test and document network coverage for one square miles pilot		✓
24	Test, document and optimize network throughput		✓
25	Document network tests and installation		✓
26	Accept network	✓	
27	Authorize network launch for users	✓	
28	Provide technical support for the network		✓
29	Monitor network operation and performance		✓
30	Identify hardware issues and report to City		✓
31	Dispatch crew and truck roll to replace/repair	✓	
32	Provide hardware warranty replacement		✓
33	Perform semi-annual optimization tests and recommendations (optional)		✓

PHASE 2 DEPLOYMENT

[Note: Deliverables shall be defined when CITY confirms the scope of supplies]

PHASE 3 DEPLOYMENT

[Note: Deliverables shall be defined when CITY confirms the scope of supplies]

PHASE 4 DEPLOYMENT – RESERVED

PHASE 5 DEPLOYMENT – RESERVED

EXHIBIT B
ENERGYAXIS® MANAGEMENT SYSTEM (EA_MS)
SOFTWARE LICENSE AGREEMENT

This Software License Agreement (this "Agreement") is made and entered into by and between Elster Solutions, LLC, a Delaware limited liability company, with offices at 208 S. Rogers Lane, Raleigh, NC 27610, USA, ("Elster"), and City of Santa Clara, a chartered California municipal corporation ("City"), with offices at 1500 Warburton Avenue, Santa Clara, CA 95050 ("Licensee").

In consideration of their mutual promises, and for other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the parties agree as follows:

1. Definitions

1.1 "Authorized User" shall mean the number of users authorized to Use the Program, as more particularly described in Appendix B-1 attached hereto and incorporated herein by this reference.

1.2 "Documentation" means Elster's published software manuals and all other written materials or documents provided by Elster to Licensee to explain the operation of the Software and to aid in its use. All Documentation shall be written in the English language.

1.3 "Equipment" shall mean the computer equipment specified in Appendix B-2.

1.4 "Meter Point" shall mean an individual device, from which Licensee collects and analyzes data using the Program.

1.5 "Operating System" shall mean the computer software system installed in a computer that controls and monitors the computer's function and provides support for the Program, as more specifically specified in Appendix B-2.

1.6 "Program" shall mean the computer software developed and owned by Elster or its affiliates and all updates, enhancements and upgrades thereto, all in the English language, as more particularly described in Appendix B-2, attached hereto and incorporated herein by this reference.

1.7 "Third Party Software" shall mean the computer software (in the English language) which is distributed by Elster under this Agreement, but which is owned by other parties (other than Elster affiliates), and listed in Appendix B-2 as Third Party Software.

1.8 "Supported System" shall mean the combination of Equipment, Operating System and third-party software specified by Elster for use with the Program and required to be procured by Licensee, as described in Appendix B-2.

1.9 "Use" means to load, execute, employ, utilize, store or display the Program.

2. License Grant

2.1 Elster hereby grants to Licensee a nonexclusive, nontransferable license, subject to the terms and conditions set forth in this Agreement, to Use the Program (in object code only) and the applicable Documentation during the term of this Agreement as follows:

2.1.1 To Use the Program, in object code only, solely in connection with Licensee's business purposes.

2.1.2 To make one copy of the Program for backup purposes only as long as that copy is not running on a server.

2.1.3 To run a non-production backup of the Program for purposes of testing and as a backup for the operational system subject to payment of the incremental license fee set forth in Appendix B-1 and in Exhibit J, Confidential Pricing Schedule, attached to the Master Agreement between the parties.

2.2 Licensee's use of the Program is limited to use in connection with the maximum number of Authorized Users, Meter Points and computers specified in Appendix B-1. Licensee may increase the number of Authorized Users, Meter Points or computers upon written request and payment of additional fees. Licensee shall use the Program on the Supported System only.

2.3 Additional license terms, if any, for the embedded Oracle components and Third Party Software are contained in Appendix B-3. To the extent such terms in Appendix B-3 are inconsistent or are in addition to the terms of this Agreement, the terms of Appendix B-3 shall control with respect to the referenced Third Party Software. Licensee shall not configure, use or install any embedded Oracle components provided by Elster or any Third Party Software separately or independently of the Program.

2.4 The license granted in Section 2.1.1 above shall be effective on the date hereof and shall continue in effect unless terminated in accordance with Section 14 of this Agreement.

2.5 Licensee shall procure the Supported System required to operate the Program, as specified in Appendix B-2, either from Elster or a third party.

3 **Ownership and Intellectual Property Rights.**

3.1 Licensee hereby acknowledges and agrees that the Program, the applicable Documentation and all patents, copyrights, trade secrets and trademarks related thereto are the exclusive property and Confidential Information of Elster or its affiliates and their licensors and that Elster or its affiliates and their licensors own all rights, title and interest, including, without limitation, all worldwide patent, copyright, trade secret and trademark rights and all goodwill associated therewith, in and to the Program.

3.2 Except for the license granted by Elster to Licensee pursuant to Section 2.1.1 of this Agreement, Licensee shall acquire no right, title or interest of any kind or nature whatsoever in or to the Program or any patent, copyright, trade secret or trademark of Elster, Elster's affiliates or Elster's licensors.

3.3 The Program is protected under United States and international copyright, trade secret and other intellectual property laws. Without limiting the generality of the foregoing, the parties acknowledge and agree that the source code, object code and all visual, printed and other outputs of the Program are trade secrets of Elster and its affiliates and licensors. Except as otherwise expressly permitted under this Agreement, Licensee may not copy, translate, modify, display, patch, alter or otherwise change or make derivative works of the Program, the applicable Documentation or any individual part thereof. Licensee shall not alter or remove any copyright notice or any propriety legend contained in or located on any part of the Program or the applicable Documentation and shall reproduce and maintain all such copyright notices or proprietary legends in and on any copy of the Program or Documentation that Licensee makes as permitted by this Agreement.

4. **Restrictions on Use, Transfer and Provision of Services.** Licensee shall not derive or attempt to derive the source code or structure of all or any portion of the Program by reverse engineering (except as required by law for interoperability), disassembly, decompilation or any other means. Licensee shall not give, sell, rent, lease, pledge, encumber, hypothecate, timeshare, provide subscription services for, sublicense, disclose, publish, assign, market, transfer or distribute any portion of the Program or the applicable Documentation or other rights to any third party, including but not limited to Licensee's subsidiaries and affiliates. Licensee shall not publish the results of any benchmark tests run on the Program and shall treat such results as Confidential Information of Elster.

5. **Confidentiality**. Each party (the "Receiving Party") shall maintain in strict confidence any and all proprietary and confidential information about the business operations or customers of the other party or any of their affiliates which it acquires in any form from the other party (the "Disclosing Party"), including without limitation the terms of this Agreement, or any other information disclosed by the Disclosing Party and identified by Disclosing Party as confidential to any third parties without Disclosing Party's prior written consent and then only after obtaining an appropriate nondisclosure agreement with each such third party. The information referred to in the preceding sentence is collectively referred to herein as the "Confidential Information." The Receiving Party further agrees to use its best efforts and to take all reasonable precautions, including such efforts and precautions as are fully commensurate with those employed for the protection of its own confidential information (but in no event less than reasonable care), to maintain strict confidentiality with respect to the Confidential Information and to prevent disclosure thereof to persons other than its employees and agents who require access thereto in order to use the Program as permitted under this Agreement and the related agreements executed in connection with this Agreement or to carry out its obligations under this Agreement. The Receiving Party agrees to take all reasonable precautions to insure that its employees and agents who are given access to the Confidential Information shall make no further disclosure thereof either to other employees or to other persons. The Receiving Party shall not use, or permit the use of, the Confidential Information for any purpose other than performing this Agreement and exercising the rights granted under this Agreement. The Receiving Party acknowledges that the rights of the Disclosing Party in the Confidential Information are unique and, accordingly, the Disclosing Party shall, in addition to such other remedies as may be available to it at law or in equity, have the right to enforce its rights hereunder by an action for injunctive relief and specific performance to the full extent permitted by law. Upon termination of this Agreement, the Receiving Party shall return or destroy all copies of all Confidential Information to the Disclosing Party. The provisions of this Article shall survive any termination of this Agreement or of any license granted hereunder.

6. **Delivery.** Elster shall deliver the number of copies of the Program specified in Appendix B-1.

7. **License Fees and Payment.**

7.1 Licensee shall pay the Software License Fee set forth in Appendix B-1 and Exhibit J, Confidential Pricing Schedule, to the Master Agreement between the parties, upon execution of this Agreement and completion of EA_MS installation and training at site or as noted in Appendix B-1. Licensee shall pay all other fees as set forth in such Exhibit J. Licensee shall pay Elster interest on any late payments at the lesser of one and one-half percent (1.5%) per month or the maximum rate permitted by law.

7.2 License fees do not include shipping charges, or any sales, use, withholding, excise or other taxes now or hereafter imposed on the production, storage, transportation, import, export, licensing or use of the products or services provided under this Agreement. Such expenses and taxes shall be paid by Licensee. Licensee shall indemnify Elster for any such expenses or taxes which Elster is required to pay.

8. **Warranties.**

8.1 Elster warrants that the media on which the Program is recorded is free from defects in materials and workmanship. Elster warrants that the Program will perform substantially in accordance with the Documentation during the Warranty Period (as defined below). THIRD PARTY SOFTWARE IS PROVIDED AS-IS, AND WITHOUT WARRANTY OF ANY KIND.

8.2 If within a period of 90 days from the date the Program is delivered to Licensee (the "Warranty Period"), it is discovered that the Program does not conform to the foregoing warranty and written notice of such nonconformity is promptly provided to Elster, Elster will provide an exclusive remedy as follows:

8.2.1 With respect to any defect in the media, Elster will replace such media;

8.2.2 With respect to any portion of the Program that does not perform in accordance with the Documentation, Elster will, at its option, repair or replace the Program and

8.2.3 With respect to any descriptive error in the Documentation, Elster will correct such error by providing addenda or substitute pages.

8.2.4 If Elster determines, in its discretion, that it is not possible to correct a Program nonconformity, Elster shall refund the license fees paid by Licensee for the Program upon Licensee's return of all copies of the Program and any associated materials, whereupon all licenses granted hereunder shall terminate.

8.2.5 The foregoing remedies shall constitute Licensee's exclusive remedies and Elster's sole liability for any failure of the Program to conform to any warranty.

8.3 EXCEPT AS SPECIFICALLY SET FORTH HEREIN, ELSTER AND ITS LICENSORS MAKE NO REPRESENTATIONS, WARRANTIES OR CONDITIONS (EXPRESS, IMPLIED, STATUTORY OR OTHERWISE), OTHER THAN AS EXPRESSLY SET FORTH IN THIS AGREEMENT. ELSTER AND ITS LICENSORS DISCLAIM ALL OTHER WARRANTIES, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF MERCHANTABILITY, ACCURACY, PERFORMANCE, EFFORT OR FITNESS FOR A PARTICULAR PURPOSE. UNDER THE LAWS OF ANY JURISDICTION. ELSTER AND ITS LICENSORS MAKE NO WARRANTY AGAINST INTERFERENCE WITH LICENSEE'S ENJOYMENT OF THE PROGRAM. ELSTER AND ITS LICENSORS DO NOT WARRANT THAT LICENSEE'S USE OF THE PROGRAM WILL BE UNINTERRUPTED OR ERROR-FREE, AND ELSTER AND ITS LICENSORS DO NOT WARRANT AS TO ANY RESULTS THAT MAY BE OBTAINED BY LICENSEE'S USE OF THE PROGRAM. ELSTER AND ITS LICENSORS DO NOT WARRANT THAT EVERY FEATURE OR ERROR IN THE PROGRAM WILL BE CORRECTED, OR THAT THE PROGRAM WILL MEET LICENSEE'S REQUIREMENTS.

9. Infringement Remedy.

9.1 Elster shall, at its expense, defend any suit which may be brought against Licensee by a third party claiming that the Program infringes upon such third party's United States patent or copyright, and Elster shall pay all judgments and costs recovered against Licensee in any such suit and shall reimburse Licensee for costs or expenses incurred by Licensee in the defense of any such suit, provided that Licensee gives Elster prompt notice of such suit no later than ten (10) days after Licensee receives notice of such suit, or sooner if required by applicable law; reasonable assistance in the defense thereof; and full opportunity to control all aspects of the defense thereof, including settlement. In the event the Program is held to be infringing, and the use of the Program is enjoined, Elster shall, at its option, procure for Licensee the right to continue using the Program; replace it with non-infringing software; modify it so it becomes non-infringing; or remove the Program or the infringing portion thereof and refund the license fees applicable thereto.

9.2 Elster's obligations under this Section do not apply with respect to a claim of infringement if and to the extent such claim arises out of: (A) compliance with Licensee's specifications, (B) the use by Licensee or any of its customers of any third-party software or equipment that infringes any patent, copyright, trademark or trade secret of any third party, (C) any modification or alteration of the Program (other than by or on behalf of Elster), (D) use of a version of the Program that has been superseded or (E) use of the Program after notice of the claimed infringement has been received by

Licensee. The foregoing states the exclusive remedy of Licensee and the sole liability of Elster for infringement.

10. Limitation of Liability. ELSTER'S TOTAL LIABILITY RELATING TO THIS AGREEMENT, THE PROGRAM OR TO THE LICENSE GRANTED HEREUNDER, WHETHER ARISING IN CONTRACT, TORT (INCLUDING NEGLIGENCE AND STRICT LIABILITY), BREACH OF WARRANTY OR ANY OTHER LEGAL THEORY SHALL NOT EXCEED THE LICENSE FEES PAID BY LICENSEE TO ELSTER UNDER THIS AGREEMENT. ELSTER AND ITS LICENSORS WILL NOT BE LIABLE IN ANY EVENT FOR LOSS OR INACCURACY OF DATA, LOSS OF USE OF SYSTEMS, COST OF REPLACEMENT SOFTWARE OR SYSTEMS, LOSS OF PROFITS, LOSS OF REVENUE OR ANY OTHER INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES, WHETHER OR NOT FORESEEABLE AND EVEN IF ELSTER HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. In no event shall Elster be liable for, and Licensee shall indemnify and hold harmless Elster, its affiliates and their respective officers, directors and employees from, any damages, losses, liabilities, costs and expenses (including reasonable attorneys' fees) arising from any improper installation or improper use by Licensee, its customers, end users or anyone other than Elster of the Program or any goods supplied by Elster , or arising from any failure by [abbrev], its customers, end users or anyone other than Elster to follow their own safety procedures in connection with the installation or use of the Program or any other goods supplied by Elster.

11. Force Majeure. Neither Party shall be liable for loss, damage, detention or delay nor be deemed to be in default for failure to perform when prevented from doing so by unforeseeable causes beyond its reasonable control, including but not limited to acts of war (declared or undeclared), Acts of God, acts of war or terrorism, fire, strike, labor difficulties, insurrection or riot, embargo or from defects or delays in the performance of its suppliers or subcontractors due to any of the foregoing enumerated causes. In the event of delay due to any such cause, the date of delivery or performance will be extended by period equal to the delay.

12. Audit. Elster and its licensors shall have the right, upon notice to Licensee, to enter onto Licensee's premises to perform an audit to ensure that Licensee is in compliance with this Agreement. Licensee shall keep, and shall allow Elster to access, accurate records of each computer on which the Program or portions of the Program are installed, the locations of such computers, the number of Meter Points for which the Program is used and the number of Authorized Users Using the Program. Elster shall have the right to disclose the results of any audits to its licensors.

13. Assignment. Licensee shall not, by contract, operation of law, or otherwise, assign, transfer or hypothecate this Agreement (in whole or in part), or delegate performance of any of its obligations under this Agreement, without in each case obtaining Elster's prior written consent, except that Licensee may assign this Agreement to an Affiliate or to a successor in connection with a merger, acquisition or sale of all or substantially all of the assets of Licensee, provided that Licensee pays Elster any incremental license fees assessed by Oracle or third party manufacturers with respect to Third Party Software in connection with such assignment.

14. Termination. Either Party may terminate this Agreement and the licenses granted hereunder if the other Party has breached any of its obligations hereunder and has failed to remedy such breach within thirty (30) days after written notice of the same. Within ten (10) days after the date of termination of this Agreement for any reason, Licensee will return to Elster or destroy the original and all copies, in whole or in part, in any form, of the Program and Documentation and an officer of Licensee shall certify to the foregoing in writing to Elster.

15. Government Regulations.

15.1 The Program is provided with RESTRICTED RIGHTS. Use, duplication, or disclosure of the Program or Documentation by any department or agency of the federal government is subject to restriction as set forth in subparagraph (b)(3) of the Right in Technical Data and Computer Software clause at DFARS 252.227-7013 or

subparagraphs (c)(1) and (2) of the Commercial Computer Software-Restricted Rights at 48 CFR 52.227-19, as applicable. For purposes thereof, "Contractor" is Elster Solutions, LLC, 208 S. Rogers Lane, Raleigh, NC 27610.

15.2 Licensee shall not export or transmit the Program or any part thereof, directly or indirectly, to any restricted countries or in any manner that would violate the Export Administration Act of 1979, as amended, or any other United States laws and regulations as shall from time to time govern the license and delivery of technology abroad by persons subject to United States law.

16. **Notices**. Any notice required or permitted hereunder shall be in writing and shall be deemed to have been delivered on the date evidenced by receipt obtained upon transmission by fax, upon delivery by commercial delivery service, or upon delivery by certified mail to a party's address or facsimile number shown below:

17.

If to Elster:	If to Licensee:
Michelle L. Simmons	To City of Santa Clara
Contract Services Administrator	Silicon Valley Power
Elster Solutions, LLC	Attention: Director of Electric Utility
208 S. Rogers Lane	1500 Warburton Avenue
Raleigh, NC 27610	Santa Clara, California 95050
michelle.simmons@us.elster.com	JRoukema@svpower.com

A party may change its address or facsimile number for receipt of notice by providing written notice to the other party.

17. **Miscellaneous.**

17.1 This Agreement, including the Appendices attached hereto, contains the entire understanding of the parties with respect to the matters contained herein. This Agreement may not be modified except by writing, executed by authorized representatives of Elster and Licensee.

17.2 The headings and captions contained herein shall not be considered to be a part hereof for purposes of interpretation or application hereof, but are for convenience only.

17.3 No action, regardless of form, arising out of the transactions under this Agreement may be brought by Licensee more than two (2) years after the cause of action has accrued.

17.4 Either party's failure to exercise any right under this Agreement shall not constitute a waiver of any other terms or conditions of this Agreement with respect to any other or subsequent breach, nor a waiver by such party of its right at any time thereafter to require exact and strict compliance with the terms hereof.

17.5 The provisions of Sections 1, 3, 4, 5, 7, 9, 10, 11, 13, 14, 15, 16 and 17 of this Agreement shall survive the cancellation, termination or expiration of this Agreement for any reason.

17.6 If any provision of this Agreement is held to be illegal, invalid or unenforceable under present or future law effective during the term hereof, such provision shall be fully severable and this Agreement shall be construed and enforced as if such illegal, invalid or unenforceable provision never comprised a part hereof, and the remaining provisions hereof shall remain in full force and effect and shall not be affected by the illegal, invalid or unenforceable provision or by its severance herefrom.

17.7 This Agreement shall be construed and governed according to the laws of the State of California, without regard to the choice of law or conflicts of law rules of any jurisdiction. The parties hereby agree that the Uniform Computer Information Transactions Act shall not apply to this Agreement.

17.8 Licensee acknowledges that this Agreement constitutes a legal agreement that obligates certain payments as noted herein. Should Licensee's business processes require that one or more purchase orders be issued to provide for payments obligated by this Agreement, that these purchase orders will be issued to address these payment obligations.

17.9 In no event shall Elster be liable for, and Licensee shall indemnify and hold harmless Elster, its affiliates and their respective officers, directors and employees from, any damages, losses, liabilities, costs and expenses (including reasonable attorneys' fees) arising from any improper installation or improper use by Licensee, its customers, end users or anyone other than Elster of the Program or any goods supplied by Elster , or arising from any failure by [abbrev], its customers, end users or anyone other than Elster to follow their own safety procedures in connection with the installation or use of the Program or any other goods supplied by Elster.

INTENDING TO BE LEGALLY BOUND, THE PARTIES HAVE CAUSED THIS AGREEMENT TO BE SIGNED AND EFFECTIVE AS OF THE LAST DATE WRITTEN BELOW.

CITY OF SANTA CLARA, CALIFORNIA
A chartered California municipal corporation

APPROVED AS TO FORM:

ELIZABETH H. SILVER
Interim City Attorney

ATTEST:

RON DIRIDON, JR.
City Clerk

JENNIFER SPARACINO
City Manager
1500 Warburton Avenue
Santa Clara, CA 95050
Telephone : 408-615-2210
Fax : 408-241-6771

ELSTER SOLUTIONS, LLC
A Delaware limited liability corporation

By: H.N. KLETT
Title: Vice President, Business Development
Address: 208 S. Rogers Lane
Raleigh, NC 27610
Telephone: 919-212-4875
Facsimile: 919-250-5483

APPENDIX B- 1

SOFTWARE LICENSE FEES

1. **Licensee's Use of the Program is restricted to the following:**

   a) **Authorized Users:** The number of authorized users is limited to the most restrictive of the following four conditions:

      i) EnergyAxis EA_MS: Unlimited number of users.(4)

      ii) Embedded Oracle Database: Unlimited number of users accessed via the EA_MS GUI or standard EA_MS interfaces. Direct access to the data or schema is prohibited per Appendix C-3. Additional CPU licensing restrictions are noted below.

      iii) Embedded Oracle Application Server: Oracle Application Server may need to be embedded in the EA_MS Software installation to support Licensor's SOAP interfaces to the EnergyAxis EA_MS software. If embedded, an unlimited number of users may access via the EA_MS GUI standard interfaces or customer integrations. Direct access to the data, schema and the Oracle Application Server is prohibited per Appendix C-3. Additional CPU licensing restrictions are noted below.

      iv) Windows 2008 Server: Limited to the number of Client Access Licenses (CALs) implemented by Licensee or by Elster (if provided by Elster).

   b) **System Configurations and number of Processors on any Server with embedded Oracle database or application server installed:** One (1) with a 4 processor maximum (5). The license fee includes the cost of middleware, database and other third party application software for:

      i) **EnergyAxis Premiere System Requirements** (Supports up to 200,000 points.)

         - 1 × Dual Core 64-bit processor requiring Oracle 11g Standard Edition software
         - 16 GB RAM
         - SAN or some type of backup system recommended. Backup and recovery of system data not covered under this agreement.

      ii) **EnergyAxis Advanced System Requirements** (Supports up to 1,000,000 points.)

         - 2 × Dual Core 64-bit processors with 16 GB RAM each for database servers requiring Oracle 11g Enterprise Edition software.
         - 2 × Quad Core 64-bit processors with 32 GB RAM each for application servers
         - 1 × Quad Core 64-bit processor with 8 GB RAM for communication server (2 Nos)
         - SAN highly recommended. Backup and recovery of system data not covered under this agreement.

      iii) **EnergyAxis Enterprise System Requirements** (Supports more than 1,000,000 points.)

         - 4 × Dual Core 64-bit processors with 32 GB RAM each for database servers requiring Oracle 11g Enterprise Edition software
         - 4 × Quad Core 64-bit processors with 48 GB RAM each for application backend servers
         - 4 × Quad Core 64-bit processors with 32 GB RAM each for application interface servers
         - 1 × Quad Core 64-bit processor with 16 GB RAM for communication server (X Nos)
         - SAN highly recommended. Backup and recovery of system data not covered under this agreement.

      iv) Additional per-processor fees may apply as defined in 2.d.ii and 2.d.iii

      v) Additional fees will also apply for additional EA_MS units as discussed in 2.d.

   c) **Computer Hardware**: See Appendix B-2, Section 3

2. **LICENSE FEES:** (1)(2)

a) **Basic License Fee Structure:** The basic license fee structure is determined by the standard configuration of the EnergyAxis system. The license fee includes the cost of middleware, database and other third party application software. Fees defined in 2 b, 2c, 2d are in addition to the basic fees

i) **EnergyAxis Premier:** Basic License Fee for each operational Elster EA_MS Server is described in Exhibit J Confidential Pricing Schedule. This includes per element license fees for up to 20,000 AMI / AMR measurement, sensing, or control elements per operational Server. The total number of AMI / AMR measurement, sensing, or control elements shall not exceed 200,000.

ii) **EnergyAxis Advanced:** Base License Fee for each operational Elster EA_MS Server is described in Exhibit J Confidential Pricing Schedule. This includes per element license fees for up to 20,000 AMI / AMR measurement, sensing, or control elements per operational Server. The total number of AMI / AMR measurement, sensing, or control elements shall not exceed 1,000,000.

iii) **EnergyAxis Enterprise:** Base License Fee for each operational Elster EA_MS Server is described in Exhibit J, Confidential Pricing Schedule. This includes per element license fees for up to 20,000 AMI / AMR measurement, sensing, or control elements per operational Server.

iv) **Additional per Processor License Fee**: License fee is for each processor beyond that specified in 1b or based on a configuration recommended by Elster requiring embedded Oracle installed per additional processor for EnergyAxis Premiere and per additional processor for EnergyAxis Advanced or Enterprise is described in Exhibit J, Confidential Pricing Schedule. Applies to all operational and backup EA_MS servers.

v) **Additional Fee for Water support –** An additional one time fee as described in Exhibit J, Confidential Pricing Schedule, applies for configuration of water support for use within the Licensee's operational infrastructure. Fees do not apply to non-operational Backup or Test systems.

vi) **Additional Fee for Gas support –** An additional one time fee as described in Exhibit J, Confidential Pricing Schedule applies for configuration of gas support for use within the Licensee's operational infrastructure. Fees do not apply to non-operational Backup or Test systems.

vii) **Third party meter support –** An additional one time fee as described in Exhibit J, Confidential Pricing Schedule applies for configuration of third party meter support for use within the Licensee's operational infrastructure. Fees do not apply to non-operational Backup or Test systems

viii) **Per Element License Fee**(3): One time fee applies to all AMI / AMR measurement, sensing, or control elements in each operational EA_MS server beyond 20,000 based on the following sliding scale (see table below). The per element license fee does not apply to non-operational Backup or Test systems.

ADDITIONAL AMI / AMR ELEMENTS BETWEEN		PRICE PER ELEMENT
20,001	50,000	Described in Exhibit J, Confidential Pricing Schedule
50,001	100,000	Described in Exhibit J, Confidential Pricing Schedule
100,001	200,000	Described in Exhibit J, Confidential Pricing Schedule
200,001	350,000	Described in Exhibit J, Confidential Pricing Schedule
350,001	500,000	Described in Exhibit J, Confidential Pricing Schedule
500,001	1,000,000	Described in Exhibit J, Confidential Pricing Schedule
1,000,001	Unlimited	Described in Exhibit J, Confidential Pricing Schedule

Standard configurations include the EnergyAxis EA_MS software with support for the following AMI / AMR measurement, sensing, or control elements:

- EnergyAxis residential electric, water and gas elements.
- EnergyAxis commercial or industrial electric, water and gas elements.
- EnergyAxis meter-based Gatekeeper elements that act as concentrators within the EnergyAxis networks.
- EnergyAxis non-meter repeater and Gatekeeper elements that act as concentrators within the EnergyAxis networks.
- Any third party meter device approved by Elster for use within the EnergyAxis networks.

b) **Optional Features:** The base license fee covers usage of the system for acquisition of metering data and two way metering operations such as on demand reads, service connects, disconnects to residential electric meters. Additional fees apply for optional modules and add on- services listed below

(1) **Additional Fee for Home Area Network (HAN) support –** An additional one time fee as described in Exhibit J, Confidential Pricing Schedule applies for configuration of HAN support for use within the Licensee's operational infrastructure. Fees do not apply to non-operational Backup or Test systems.

(2) **Home Area Network / Demand Response Per Device Fee –** One time fee applies to home area network / demand response devices in each operational EA_MS system based on the following sliding scale (see table below). The per device fee includes any Elster-manufactured or third party device approved by Elster for use in a Home Area Network / Demand Response scenario within the EnergyAxis networks. The per device fee does not apply to non-operational Backup or Test systems.

ADDITIONAL HAN / DR DEVICES BETWEEN		PRICE PER DEVICE
1	20,000	Described in Exhibit J, Confidential Pricing Schedule
20,001	50,000	Described in Exhibit J, Confidential Pricing Schedule
50,001	100,000	Described in Exhibit J, Confidential Pricing Schedule
100,001	200,000	Described in Exhibit J, Confidential Pricing Schedule
200,001	350,000	Described in Exhibit J, Confidential Pricing Schedule
350,001	500,000	Described in Exhibit J, Confidential Pricing Schedule
500,001	1,000,000	Described in Exhibit J, Confidential Pricing Schedule
1,000,001	Unlimited	Described in Exhibit J, Confidential Pricing Schedule

(3) **Distribution System / Distribution Automation support –** An additional one time fee as described in Exhibit J, Confidential Pricing Schedule, applies for configuration of distribution system / distribution automation support for use within the Licensee's operational infrastructure. Fees do not apply to non-operational Backup or Test systems.

(4) **Distribution System / Distribution Automation Per Device Fee –** One time fee applies to distribution system / distribution automation elements in each operational EA_MS system based on the following sliding scale (see table below). The per element fee includes any Elster-manufactured or third party element approved by Elster for use in a distribution system / distribution automation scenario within the EnergyAxis networks. The per element fee does not apply to non-operational Backup or Test systems.

ADDITIONAL DS / DA ELEMENTS BETWEEN		PRICE PER ELEMENT
1	100	Described in Exhibit J, Confidential Pricing Schedule
101	1,000	Described in Exhibit J, Confidential Pricing Schedule
1,001	10,000	Described in Exhibit J, Confidential Pricing Schedule
10,001	50,000	Described in Exhibit J, Confidential Pricing Schedule
50,001	Unlimited	Described in Exhibit J, Confidential Pricing Schedule

(5) **Stand alone element / Direct Wide Area Network (WAN) connection support –** An additional one time fee as described in Exhibit J, Confidential Pricing Schedule,

applies for configuration of stand alone elements / direct WAN connection support for use within the Licensee's operational infrastructure. Fees do not apply to non-operational Backup or Test systems.

(6) **MV90xi HHF conversion application for C&I meters: is described in Exhibit J, Confidential Pricing Schedule, per operational system**

(7) **Optional Features and Interfaces.** – Elster reserves the right to commercialize new features, endpoints and interfaces as optional add-ons to the base system features. Additional license fees may apply unless the feature or interface was part of the contractual scope jointly agreed between Elster and the Licensee.

(8) **EA_Inspector and Route Manager Fee** – Software fees for the EA_Inspector equipment is per the table below. It is the Licensee's responsibility to maintain the Supported System to maintain the operating system software. Licensee must also maintain an active EA_MS Maintenance Agreement. An EA_Inspector Maintenance Agreement is available through a separate agreement. The EA_Inspector Equipment may be purchased per Elster Standard Terms and Conditions.

Software License Fees	**Price per each**
EA_Inspector Manager (required for the EA_Inspector)	
• Base license for up to 10 (handheld) devices	Described in Exhibit J, Confidential Pricing Schedule
• License per each 10 additional devices	Described in Exhibit J, Confidential Pricing Schedule
• Site license (unlimited devices)	Described in Exhibit J, Confidential Pricing Schedule
Route Manager (required for the PI 900)	
• Base license for up to 10 (handheld) devices	Described in Exhibit J, Confidential Pricing Schedule
• License per each 10 additional devices	Described in Exhibit J, Confidential Pricing Schedule
• Site license (unlimited devices)	Described in Exhibit J, Confidential Pricing Schedule

c) **System Maintenance Agreement Fee:** A System Maintenance Agreement is required for the first partial year following EA_MS delivery, subject to the terms of a separately executed System Maintenance Agreement (SMA).

d) **Additional Fees :** Additional fees apply to additions specified by the Licensee to the standard EnergyAxis systems

i) **Backup or Test System License fee** (if applicable) – Elster highly recommends that the Licensee at a minimum purchase and configure a backup system and for large implementations purchase an additional system to allow for integration testing with out compromising the integrity of the production system. Additionally, Elster requires each back up or test system is an identical replica of the production system as detailed in 1b.

(1) **EnergyAxis Premiere:** is described in Exhibit J, Confidential Pricing Schedule

(2) **EnergyAxis Advanced:** is described in Exhibit J, Confidential Pricing Schedule

(3) **EnergyAxis Enterprise:** is described in Exhibit J, Confidential Pricing Schedule

ii) **Embedded instances of Virtual Machine (VM):** An additional one time fee as described in Exhibit J, Confidential Pricing Schedule, per processor applies for the configuration of Virtual Machine support for use within the Licensee's Backup or Test system infrastructure. Fees do not apply to operational systems and is not valid for use on operational systems. Requires EnergyAxis Advanced or Enterprise.

iii) **Embedded instances of Oracle Enterprise Edition database or application software:** License fees are based on Standard Edition or Standard Edition One of the embedded Oracle database server and Oracle application server (if applicable). An additional fee as described in Exhibit J, Confidential Pricing Schedule will apply for use of Enterprise editions of Oracle software.

3. **Additional System Expansions and Optional Project Implementation Services:** System expansions and project implementation services beyond the standard project services defined above can be provided on time and material (T&M) basis. Current rates and additional terms that apply are listed in Appendix C-3 of the System Maintenance Agreement.

NOTES:

1. All software license fees are in US Dollars.
2. Prices are valid for deliveries in 2010.
3. Elster reserves the right to periodically audit the user's EA_MS Server to determine the current number and types of meters or control points deployed for the purposes of billing an additional per point license fees. No refund is allowed for a reduced number of points determined by a given audit.
4. Elster does not limit the number of users of its EA_MS software, nor does Oracle for the embedded processor license provided by Elster with the EA_MS software. If Elster provides the server hardware and Microsoft 2008 or newer when available, the user is limited to the default maximum of five (5) users per the MS Windows server license. If Licensee provides the hardware or desires system accessibility for more users, the Licensee is responsible for obtaining the Microsoft 2008 Server license or license expansion, including any additional fees for the desired number of CALs (Client access licenses).
5. See Appendix B-2 Notes for hardware considerations.

APPENDIX B-2
SOFTWARE PROGRAM

1. THE PROGRAM [1]

Elster EnergyAxis Management System (EA_MS) which includes:

(i) **Data Acquisition Module** for the following supported Elster meters:

- Residential meters with 900 MHz EnergyAxis communications
- C & I Meters with 900 MHz EnergyAxis communications
- A3 ALPHA Gatekeeper meters with 900 MHz EnergyAxis communications
- A3 ALPHA meters
- Elster AMI Water Modules
- Elster AMI Gas Modules

(ii) **Supported EA_MS Communications**:

- Switched circuit Public Service Telephone or Cellular Networks (via Elster approved PSTN or cellular modems)
- IP-based connections (via Elster approved IP-addressable modems with RS-232 outputs)
- Integrated SmartSynch GPRS Gatekeeper communications (when commercially available)
- Elster MAS Monitoring Tool

(iii) **Database System** [3][4][5] – An embedded Oracle database system is included in the EA_MS product. Maintenance support is available only from Elster. Maintenance for the first partial calendar year is included in the mandatory System Maintenance Agreement. Support for subsequent years is included as part of the ongoing EA_MS Software System Maintenance Agreement if elected by the Licensee.

(iv) EA_Inspector and/or Route Manager Software consisting of:

- **EA_Inspector Manager installed on the customer computer system(s)**
- **Route Manager installed on the customer computer system(s)**
- **The EA_Inspector application on the handheld device(s) used with the system**
- **PI 900 software on the handheld device(s) used with the system**

1.

2. THIRD PARTY SOFTWARE [1] [6] [7]

a) **Operating System:** Windows 2008 Server Standard Edition required in 2010 and beyond [2]

b) **Clients:** Microsoft Internet Explorer 6.0 (or approved subsequent IE release) [2]

c) **NetBeans**

NOTES:

(1) All Elster Software, Third Party Software, documentation and any related materials shall be provided in the English language.

(2) It is the Licensee's responsibility to acquire and maintain the Supported System and this Third Party Software. Elster will specify the third party software and versions thereof (operating system, software products, etc.) required for each Program release.

(3) Operation of a EA_MS server with embedded Oracle installed that is capable of expansion to more than 4 processors is not allowed unless the server is hardware partitioned such that the EA_MS embedded Oracle database is running in a partition of 4 or fewer processors.

(4) Processor Quantities for Software License Fee Purposes – Some servers include dual or multi-core processors (multiple central processing units supplied in a single chip or processor package). For the purpose of the Per Processor License fees, in any computer with dual or multi-core processors, Oracle's treatment of dual and multi-core processors will apply.

(5) Per Oracle's distribution agreement with Elster, Embedded Oracle software can only be supplied by Elster. No access to the core Oracle functionality is allowed except via the EA_MS GUI interface and the import/export functionality provided as a part of Elster's EA_MS product.

   a. This software license is not limited in the number of meters that can be read as long as the processor, production, backup and test restrictions are satisfied. Specific hardware requirements must be agreed to with Elster depending on the total meter counts, number of meters being read for LP, etc. need to be discussed with Elster.

   b. Future changes in the Software or the Third-Party Software or running of other third-party software programs not tested or provided by Elster could impact EA_MS system performance on a given hardware platform. For example, running virus-scanning software during a billing read could adversely affect the system's ability to process the readings in a timely manner. These situations may or may not be rectified by various means such as changing the scheduled virus scan time or the meter read schedule time.

APPENDIX B-3
ADDITIONAL LICENSE TERMS

ORACLE:

1. The Oracle programs licensed as part of the Program are subject to a restricted license and can only be configured, installed and used in conjunction with the authorized use of the Program. Licensee shall not navigate the underlying data schema.
2. Licensee shall not modify any Oracle programs licensed under this Agreement.
3. Oracle shall not be liable for any damages, whether direct, indirect, incidental, or consequential arising from Licensee's use of the Program.
4. Licensee hereby acknowledges and agrees that Oracle Corporation is an intended third party beneficiary to this Agreement.

NetBeans:

The source code for the software contained in the file **schema2beans.jar and schema2beansdev.jar** (the "Covered Code") is available by contacting Elster at Elster Solutions, LLC, 208 S. Rogers Lane, Raleigh, NC 27610, Attn: Contracts Manager. Upon request, Elster will make the source code for the Covered Code available to Licensee, subject to the terms of the Sun Public License, version 1.0, which can be found at http://www.sun.com.

COVERED CODE IS PROVIDED UNDER THIS LICENSE ON AN "AS IS" BASIS, WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING, WITHOUT LIMITATION, WARRANTIES THAT THE COVERED CODE IS FREE OF DEFECTS, MERCHANTABLE, FIT FOR A PARTICULAR PURPOSE OR NON-INFRINGING. THE ENTIRE RISK AS TO THE QUALITY AND PERFORMANCE OF THE COVERED CODE IS WITH LICENSEE. SHOULD ANY COVERED CODE PROVE DEFECTIVE IN ANY RESPECT, LICENSEE (NOT ELSTER, THE INITIAL DEVELOPER OR ANY OTHER CONTRIBUTOR) ASSUME THE COST OF ANY NECESSARY SERVICING, REPAIR OR CORRECTION. THIS DISCLAIMER OF WARRANTY CONSTITUTES AN ESSENTIAL PART OF THIS LICENSE. NO USE OF ANY COVERED CODE IS AUTHORIZED HEREUNDER EXCEPT UNDER THIS DISCLAIMER.

Any terms of this License Agreement that grant any rights to Licensee with respect to the Covered Code that are in addition to the rights granted to licensees under the Sun Public License are offered by Elster only.

APPENDIX B-4

License Fees	Qty	Unit Price	Ext. Price
Base License Fee: EnergyAxis Premier		**	$0.00
Base License Fee: EnergyAxis Advanced		**	$0.00
Base License Fee: EnergyAxis Enterprise		**	$0.00
Additional Per Processor License Fee		**	$0.00
Additional Fee for Water Module Support		**	$0.00
Additional Fee for Gas Module Support		**	$0.00
Additional Fee for Third Party Meter Support		**	$0.00
Additional per AMI / AMR element license fees (0-20,000)		**	$0.00
Additional per AMI / AMR element license fees (20,000-50,000)		**	$0.00
Additional per AMI / AMR element license fees (50,000-100,000)		**	$0.00
Additional per AMI / AMR element license fees (100,000-200,000)		**	$0.00
Additional per AMI / AMR element license fees (200,000-350,000)		**	$0.00
Additional per AMI / AMR element license fees (350,000-500,000)		**	$0.00
Additional per AMI / AMR element license fees (500,000-1,000,000)		**	$0.00
Additional per AMI / AMR element license fees (1,000,000+)		**	$0.00
Additional Fee for Home Area Network (HAN) Support		**	$0.00
Additional HAN / DR device license fees (0-20,000)		**	$0.00
Additional HAN / DR device license fees (20,000-50,000)		**	$0.00
Additional HAN / DR device license fees (50,000-100,000)		**	$0.00
Additional HAN / DR device license fees (100,000-200,000)		**	$0.00
Additional HAN / DR device license fees (200,000-350,000)		**	$0.00
Additional HAN / DR device license fees (350,000-500,000)		**	$0.00
Additional HAN / DR device license fees (500,000-1,000,000)		**	$0.00
Additional HAN / DR device license fees (1,000,000+)		**	$0.00
Additional Fee for Distribution System / Distribution Automation Support		**	$0.00
Additional DS / DA element license fees (0-100)		**	$0.00
Additional DS / DA element license fees (100-1,000)		**	$0.00
Additional DS / DA element license fees (1,000-10,000)		**	$0.00
Additional DS / DA element license fees (10,000-50,000)		**	$0.00
Additional DS / DA element license fees (50,000+)		**	$0.00
Additional Fee for Stand Alone Element / Direct WAN Connection Support		**	$0.00
Additional Fees for Software License		**	
EA_Inspector Manager (required for the EA_Inspector)		**	
Base license for up to 10 (handheld) devices		**	
License per each 10 additional devices		**	
Site license (unlimited devices)		**	
Route Manager (required for the PI 900)		**	
Base license for up to 10 (handheld) devices		**	
License per each 10 additional devices		**	
Site license (unlimited devices)		**	

Additional Fee for MV90xi HHF Conversion Support		**	$0.00
Additional Fee for Custom SW Development / Integration		**	$0.00
Backup / Test System License Fee: EA Premier		**	$0.00
Backup / Test System License Fee: EA Advanced		**	$0.00
Backup / Test System License Fee: EA Enterprise		**	$0.00
Embedded Instances of Virtual Machine (VM)		**	$0.00
Embedded Instances of Oracle Enterprise Edition		**	--
Additional System Expansions and Optional Project Implementation Services		**	--
Subtotal - Software License Agreement Fees			**$0.00**

(**as described in Exhibit J, Confidential Pricing Schedule)

EXHIBIT C
ENERGYAXIS® MANAGEMENT SYSTEM (EA_MS)
SYSTEM MAINTENANCE AGREEMENT

BETWEEN

Elster Solutions, LLC **208 S. Rogers Lane** **Raleigh, North Carolina 27610**	**and**	City of Santa Clara, California 1500 Warburton Avenue Santa Clara, California 95050
(LICENSOR)		**(LICENSEE)**

THIS SYSTEM MAINTENANCE AGREEMENT (this "Agreement") is by and between **Elster Solutions, LLC** ("Licensor") and City of Santa Clara, California ("Licensee") and is effective this ___ day of November 2010. Licensor will provide system maintenance services ("System Maintenance Services") for the Program licensed to Licensee pursuant to that certain **EnergyAxis** Management System Software License Agreement, dated as of the date hereof, by and between Licensor and Licensee (the "Software License Agreement") and described in Appendix C-1. Capitalized terms herein not otherwise defined shall have the meaning set forth in the Software License Agreement. The terms and conditions of the License Agreement shall govern Licensee's use of the Program.

1. This System Maintenance Agreement shall serve as the exclusive definition of the System Maintenance Services for the Program.

2. The term of this System Maintenance Agreement shall commence upon the above effective date and shall continue until December 31 of that effective year (the "Initial Term"). Thereafter, this System Maintenance Agreement shall automatically renew for successive one-year renewal terms (each a "Renewal Term") unless the System Maintenance Agreement is terminated by either party upon written notice thirty (30) days prior to the end of the Initial Term or the then-current Renewal Term, as the case may be, with such termination to be effective upon completion of such term. Licensor shall have the right to increase System Maintenance Fees annually, provided Licensor provides Licensee written notice of the increased fees no later than sixty (60) days prior to the end of the current calendar year. Licensee may reinstate lapsed support and maintenance for the Program licensed from Licensor upon payment of 150% of all support and maintenance fees in arrears and all costs invoiced by Licensor on a time and materials basis for updating Licensee's Program to the then-current version.

3. System Maintenance Services shall consist of the following:

   A. Software Upgrade Service

   Software Upgrade Service includes:

   - Distribution of the following Software Upgrades:
     - **Patch Upgrades** – Software Upgrades that include a fix for a known bug or software operational problem, which causes the Program not to perform as designed. Patch Upgrades are typically identified by a change in the second decimal of the Program version number (i.e., 2.2.2 to 2.2.3).
     - **Maintenance Upgrades** – Software Upgrades that are primarily maintenance related. Only minor functionality changes may be included. Maintenance Upgrades are typically identified by a change in the first decimal of the Program version number (i.e., 2.2.0 to 2.3.0).

- **Functional Upgrades** – Software Upgrades that include significant database changes or significant functional changes. Functional Upgrades typically will be identified by a change in the whole number of the Program version number (i.e., 2.0.0 to 3.0.0).

- Distribution of one copy of corresponding standard documentation update on CD in English.

- These upgrade services only apply to the Program and Modules originally supplied by Licensor and identified in the Program's Scope in Appendix C-1 of this System Maintenance Agreement.

- Licensor will specify third party software and version thereof that Licensee is required to have for each Software Upgrade.

- To the extent any Software Upgrade contains new Third Party Software, Licensee shall comply with any and all license terms associated with such Third Party Software. Licensor shall notify Licensee of such license terms when the Software Upgrade is distributed to Licensee. Licensee's installation and use of the Software Upgrade shall be deemed Licensee's acceptance of such license terms and agreement to be bound by such license terms. To the extent any Third Party Software license terms are inconsistent with the terms of the Software License Agreement, such Third Party Software license terms shall control with respect to the Third Party Software.

B. System Support

System Support covers the latest commercially available version of the Program delivered to Customer and one previous version up to one 180 days following the commercially available date of the current release of the latest version of the Program and Modules originally supplied by Licensor and identified in the Program's Scope in Appendix C-1 of this System Maintenance Agreement. The parties may amend this System Maintenance Agreement to add additional Modules licensed by Licensee, subject to additional System Maintenance Fees and terms. Maintenance for other third-party software, such as the computer operating system, must be obtained from the supplier and is the responsibility of the Licensee. Licensor will provide support for embedded Oracle software according to Oracle's then-current support policies.

System Support includes telephone and email support that does not require access to the production, test or backup system and that is limited to information readily accessible to tech support personnel, such as operation manuals and similar documentation ("Casual Consulting"). System Support also includes support that may require more experienced technical support personnel, system analysis, and access to the production, test or backup system ("Technical Support"). System Support does not include any On-Site Support (as defined below). For the purposes of this System Maintenance Agreement, an "error" shall mean either: (i) a material nonconformity to the then-current applicable specifications; or (ii) a defect which materially impairs use.

Standard 5x9 software support includes the following services:

- Casual Consulting and Technical Support during:

  Elster's normal business hours, Monday through Friday (8:00 AM to 5:00 PM, Eastern Standard Time or Eastern Daylight time as applicable), except for Elster holidays. Alternate hours can be negotiated as part of the contract.

- Access to Casual Consulting and Technical Support is available via a toll-free number and customer specific PIN. The EnergyAxis Software Support line, 866-

554-9007 or +919 250-5717, is available 24 hours a day 7 days a week. The line is staffed during Elster's normal business hours as mentioned above. If you call during normal business hours and no support engineer is available to take your call, your call will be routed to a voice mailbox exclusively for this service. If you leave your name and telephone number, the next available support engineer will return your call. Elster's voice mail system includes an out calling function that is used to notify the on call support personnel for customers who have an extended hours SMA.

- Access to Casual Consulting and Technical support is also available via email. Email should be sent to EnergyAxis.Support@elstersupport.com. Emails sent to this address are automatically routed to the support engineers, who will respond during Elster's normal business hours as described above.
- Technical assistance regarding installation and operation of the Program and Software Upgrades
- General support regarding proper utilization of the Program
- Telephone and email support
- Attempted replication of errors reported by Licensee
- Assistance with Licensor's user documentation and technical manuals provided with the Program
- Guidance on the Program's intended, normal use
- Licensor shall use commercially reasonable efforts to resolve each replicated error by providing either: (1) a reasonable work-around; (2) a change to the Program code; or (3) an action plan for resolving the error.

As shown in Appendix C-2, support on a 7x12 and 7x24 is available for additional fees. For the Initial Term of this System Maintenance Agreement, Licensee has selected the support level indicated in the signature block of this document. To change support levels, Licensee must request such change in writing no later than October 1 of the then-current year. Licensor will approve or reject the request in writing no later than December 1 of the then-current year, and, if approved, Licensor will invoice Licensee for the new level of support. All approved changes will be effective as of January 1 of the next calendar year.

C. Possible Interference Support

Elster will support SVP in the investigation of possible interference of the EnergyAxis system with external end customer supplied electrical products. While the EnergyAxis system complies with FCC regulations and guidelines, there have been a small number of consumer products that have been built that do not comply with regulations. Elster will support SVP in investigating and providing recommendations to resolve conflicts.

D. Additional and Excluded Services

(i) On-Site Support. Support Services shall not include On-Site Support. For the purposes of this System Maintenance Agreement, "On Site Support" shall occur when:

(a) Licensor is requested by Licensee to arrive at a Licensee location to provide support and/or consultation services;

(b) Licensor is contacted outside of contracted support hours and must (at the approval of Licensee) travel to another location (including Licensor's site) to complete the required services; and

(c) Licensor is contacted during contracted support hours and must (at the approval of Licensee) travel to a separate location to complete the required services.

Any travel to Licensee's site requires prior approval of Elster management. Any On-Site Support provided at the request or approval of Licensee shall be billed on an per hour basis at the then-current labor rates reflected in Appendix C-3 and Exhibit J, Confidential Pricing Schedule, to the Master Agreement between the parties, plus reasonable travel and living expenses (including a 10% administrative fee); provided, however, Licensee shall not be billed for travel non-working time. On-Site Support and services will be provided under Elster's then-current standard service terms and rates.

(ii) Additional Services. The following items, among others, are specifically excluded from this System Maintenance Agreement but may be purchased separately for additional fees (see Appendix C-3 and Exhibit J, Confidential Pricing Schedule, to the Master Agreement between the parties) to be charged by Licensor as specified in Section 4 below:

- Distribution or maintenance of Program Modules not listed in Appendix C-1
- Interpretation of the Program's results
- Supply of typical or representative data
- Assistance with computer hardware and peripheral questions not related to the Program's use
- Assistance with installation, upgrade and maintenance of computer operating system, data base or other software questions not directly pertinent to the Management System Program
- Data debugging and/or correcting
- Services necessitated as a result of any cause other than the Program's ordinary, proper use by Licensee, including but not limited to neglect, abuse, unauthorized maintenance, or electrical, fire, water, or other damage
- Special applications of the Program
- Services resulting from the failure of Licensee to provide a suitable environment for the Program or associated equipment
- Services resulting from failure of Licensee to provide adequate system administration of the Management System, including, but not limited to, normal system administration functions such as ensuring adequate disk space is available on the servers, reliable power quality equipment is in place (UPS) and adequate system backup procedures are followed.
- Service on any prior version of the Program, except that Elster will continue to support a prior version of the Program in accordance with the terms of Section 3(B) of this System Maintenance Agreement

- Any problem caused by modifications in any version of the Program not made or authorized by Licensor
- Any problem resulting from the combination of the Program with such other programming or equipment to the extent such combination has not been approved in writing by Elster
- Any problem caused by communications facilities and infrastructure (telephone, etc.)
- Site planning for locating meters or gatekeepers
- IT infrastructure consulting on system management strategy
- Testing of unsupported system hardware or communication devices.

(iii) Excluded Services. Licensor shall not, under any circumstances, be obligated to perform the following services:

- Services to accessories, attachments, equipment, machines or devices
- Electrical or plumbing work to equipment
- Service which is impractical for Licensor to render because of, or service which would affect portions of the Program modified through, modifications to the Program made by persons other than Licensor, its authorized representatives or its third party suppliers
- Services that would result in any violation of any federal, state or local law or regulation (including, without limitation, the Export Administration Laws)

4. System Maintenance Fees are calculated based on the calendar year. The annual System Maintenance Fees for the current year are set forth on Appendix C-2, attached hereto and incorporated herein by reference. Upon the effective date of this agreement or on a date as specified in an associated system contract, Licensee shall pay the then-current annual System Maintenance Fee, pro-rated based on the number of months remaining in the calendar year from the effective date of this agreement. Thereafter, annual System Maintenance Fees will be invoiced in October of each year, with payment for the next year's System Maintenance due no later than December 31 of the current year. On Site Support services and any other Additional Services will be billed at the end of the month in which the services are provided. Fees for Modules licensed separately by Licensee shall be charged pursuant to the applicable Module License System Maintenance Agreement. Except as specifically set forth in this System Maintenance Agreement, all invoices are due net thirty (30) days from the date of invoice. Licensor will assess a late payment charge on any amount which remains unpaid after it is due, computed at the rate equal to the lesser of one and one-half percent (1.5%) per month or the maximum amount permitted by law on the unpaid amount for each month that such amount remains unpaid. This late payment charge shall be in addition to any other remedies Licensor may have at law or in equity. All System Maintenance Fees are in US dollars.

5. Either party shall have the right to terminate this System Maintenance Agreement in the event that the other party breaches any material provision of this System Maintenance Agreement and such breach is not cured within thirty (30) days after receipt of notification thereof.

6. The maximum liability of Licensor for any direct damages sustained by the Licensee under this System Maintenance Agreement shall in no circumstance exceed the amount of the annual maintenance fee payable by the Licensee to Licensor for the then-current year. Licensor shall in no event be liable to Licensee for loss of revenue, profit, anticipated profit or indirect, incidental, special or consequential damages, including but not limited to, any losses to Licensee resulting from lost computer time or the destruction or damage of records, or any claims or demands made against the Licensee by a third party.

7. During the term of this System Maintenance Agreement, Licensee shall:

   a. Obtain, install and maintain, and provide to Licensor at no cost to Licensor, full VPN broadband access to all production, backup and test Management System servers under support to allow Licensor to perform System Maintenance for the Program from Licensor's facilities in North Carolina. Reasonable allowance will be made to adhere to Licensee's corporate security administration and monitoring policies. However, during periods when Elster has access to the Management System servers, access will be at the administrator level.

   b. Ensure that only personnel properly trained in the operation and use of the Program and its associated equipment call Licensor for direct phone support and that such personnel have sufficient access and computer time when using such service in order to implement the corrections suggested by Licensor;

   c. Install all Software Upgrades within 60 days of delivery of same;

   d. Perform and install all diagnostic activities and routines recommended by Licensor before requesting On-Site Support;

   e. Ensure the proper Program environment is maintained and that Licensee's personnel who have access to the Program are properly trained in the operation and usage of the Program and the associated equipment.

   f. Provide adequate safeguards for the protection of Licensee's data and files while the System Maintenance is being performed on the Program.

   g. Issue any purchase orders that might be required by Licensee's business processes to honor the payments obligated by this agreement.

   h. Maintain the Management System servers consistent with industry standards on end of life planning for server systems. Elster's general recommendation is that Licensees plan for server replacements on a 3 year cycle to consider hardware and OS obsolescence and to provide latest generation servers to support new features provided in Management System Program releases provided as a part of this SMA.

8. Licensee shall be solely responsible to ensure that all of its files and data are adequately duplicated or documented, and Licensor shall in no way be responsible for Licensee's failure to do so, nor for the costs or expenses of reconstructing data which are lost, destroyed or otherwise damaged or rendered useless during the course of or as the result of the performance of any services under this System Maintenance Agreement.

9. The parties shall treat all Confidential Information disclosed under this Agreement in accordance with the terms of Section 5 of the Software License Agreement. The terms of Section 5 of the Software License Agreement are hereby incorporated in this System Maintenance Agreement by this reference.

10. Neither Party shall be liable for loss, damage, detention or delay nor be deemed to be in default for failure to perform when prevented from doing so by unforeseeable causes beyond its reasonable control, including but not limited to acts of war (declared or undeclared), Acts of God, acts of war or terrorism, fire, strike, labor difficulties, insurrection or riot, embargo or from defects or delays in the performance of its suppliers or subcontractors due to any of the foregoing enumerated causes. In the event of delay due to any such cause, the date of delivery or performance will be extended by period equal to the delay.

11. Licensee shall not, by contract, operation of law, or otherwise, assign this System Maintenance Agreement (in whole or in part), or delegate performance of any of its obligations under this System Maintenance Agreement, without in each case obtaining Licensor's prior written consent.

12. Any notice required or permitted hereunder shall be in writing and shall be deemed to have been delivered on the date evidenced by receipt obtained upon transmission by fax, upon delivery by commercial delivery service, or upon delivery by certified mail to a party's address or facsimile number shown below:

If to Elster:	**If to Licensee:**
Michelle L. Simmons	To City of Santa Clara
Contract Services Administrator	Silicon Valley Power
Elster Solutions, LLC	Attention: Director of Electric Utility
208 S. Rogers Lane	1500 Warburton Avenue
Raleigh, NC 27610	Santa Clara, California 95050
michelle.simmons@us.elster.com	JRoukema@svpower.com

A party may change its address or facsimile number for receipt of notice by providing written notice to the other party.

13. This System Maintenance Agreement, including the Appendices attached hereto, contain the entire understanding of the parties with respect to the matters contained herein. This System Maintenance Agreement may not be modified except by writing, executed by authorized representatives of Licensor and Licensee. If any provision hereof is or becomes, at any time or for any reason, unenforceable or invalid, no other provision hereof shall be affected thereby, the remaining provisions shall continue with the same effect as if such unenforceable or invalid provision shall not have been inserted herein.

14. The headings and captions contained herein shall not be considered to be a part hereof for purposes of interpretation or application hereof, but are for convenience only.

15. No action, regardless of form, arising out of the transactions under this System Maintenance Agreement may be brought by Licensee more than two (2) years after the cause of action has accrued.

16. Either party's failure to exercise any right under this System Maintenance Agreement shall not constitute a waiver of any other terms or conditions of this System Maintenance Agreement with respect to any other or subsequent breach, nor a waiver by such party of its right at any time thereafter to require exact and strict compliance with the terms hereof.

17. If Licensee issues a purchase order or other document that purports to define System Maintenance other than as set forth in this System Maintenance Agreement, it is agreed that the terms and conditions of any such purchase order shall have no application or effect, and that the provisions of this System Maintenance Agreement shall continue to control matters related to the provision of System Maintenance.

18. The provisions of Sections 1, 6, 8, 10, 11, 12, 13, 14, 15, 16, 17, 18 and 19 shall survive the expiration or termination of this System Maintenance Agreement for any reason.

19. This System Maintenance Agreement shall be construed and governed according to the laws of the State of California without regard to the choice of law or conflicts of law rules of any jurisdiction.

EXCEPT AS EXPRESSLY PROVIDED HEREIN, LICENSOR MAKES NO REPRESENTATIONS OR WARRANTIES UNDER THIS SYSTEM MAINTENANCE AGREEMENT WHATSOEVER WHETHER STATUTORY, EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO

WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE AND ALL WARRANTIES ARISING FROM COURSE OF DEALING OR USAGE OF TRADE.

IN WITNESS WHEREOF, the parties have caused their duly authorized representatives to execute this System Maintenance Agreement.

CITY OF SANTA CLARA, CALIFORNIA
A chartered California municipal corporation

APPROVED AS TO FORM:

ELIZABETH H. SILVER
Interim City Attorney

ATTEST:

RON DIRIDON, JR.
City Clerk

JENNIFER SPARACINO
City Manager
1500 Warburton Avenue
Santa Clara, CA 95050
Telephone : 408-615-2210
Fax : 408-241-6771

ELSTER SOLUTIONS, LLC
a Delaware limited liability corporation

By: H.N. KLETT
Title: Vice President, Business Development
Address: 208 S. Rogers Lane
Raleigh, NC 27610
Telephone: 919-212-4875
Facsimile: 919-250-5483

:

SELECTED SUPPORT LEVEL

Support level	Description	Licensee's Selected Support Level ("X")
Standard Support (5*9)	Monday through Friday ,8 AM -5 PM Eastern Time except designated Elster holidays	
Extended Weekend Support	8 AM – 8 PM Eastern Time all 7 days of week	
7 * 24 Support	Access to Customer Support personnel 24 hours a day, 7 days a week	X

APPENDIX C-1
SCOPE OF PROGRAM AND SUPPORTED SYSTEM

ELSTER PRODUCTS

The Program: As defined in Appendix B-2 of the Software License Agreement

Operating System: Microsoft Windows 2008 Server standard edition

EnergyAxis Premiere System Requirements

- 1 × Dual Core 64-bit processor
- 16 GB RAM
- Oracle 11g Standard Edition
- SAN or some type of backup system recommended. Backup and recovery of system data not covered under this agreement.

EnergyAxis Advanced System Requirements

- 2 × Dual Core 64-bit processors with 16 GB RAM each for database servers
- 2 × Quad Core 64-bit processors with 32 GB RAM each for application servers
- 1 × Quad Core 64-bit processor with 8 GB RAM for communication server (2 Nos)
- Oracle 11g Enterprise Edition
- SAN highly recommended. Backup and recovery of system data not covered under this agreement.

EnergyAxis Enterprise System Requirements

- 4 × Dual Core 64-bit processors with 32 GB RAM each for database servers
- 4 × Quad Core 64-bit processors with 48 GB RAM each for application backend servers
- 4 × Quad Core 64-bit processors with 32 GB RAM each for application interface servers
- 1 × Quad Core 64-bit processor with 16 GB RAM for communication server (X Nos)
- Oracle 11g Enterprise Edition
- SAN highly recommended. Backup and recovery of system data not covered under this agreement.

NOTES:

1. It is the Licensee's responsibility to maintain the Supported System and to maintain the operating system software shown above. Licensor will specify the third party software and version thereof required for each Software Upgrade or release.
2. ORACLE is a registered trademark of the Oracle Corporation.
3. Windows is a registered trademark of Microsoft Corporation.
4. EnergyAxis, REX, and A3 ALPHA are registered trademarks of Elster Solutions, LLC.

APPENDIX C-2
YEARLY SYSTEM MAINTENANCE AGREEMENT FEES

1. System Maintenance Fee for Licensee's each operational server: The system maintenance fees are structured based on the level of support and the total system size as follows:

i. A base maintenance and support fee to cover smaller system configurations

ii. A percentage of the total license fees based on overall system volume and the desired support level

iii. A network maintenance fee applied to all AMI / AMR measurement, control, and sensing elements, HAN / DR devices, and DA / DS devices as defined in the Elster Software License Agreement

The table below describes the structure and calculation methodology for system maintenance fees for the EnergyAxis Management System. [1, 2]

Support Level	Base SMA(2)	Percent of License Fees
Standard Support (5*9)	**	**
Extended Weekend Support (7*12)	**	**
7* 24 Support	**	**

(** as described in Exhibit J, Confidential Pricing Schedule, to the Master Agreement between the parties)

The methodology used to determine annual support fees is the GREATER OF:

i. The Base SMA for the desired support level OR

ii. Total SMA = [Percent of License Fees * Total License Fee] + Network Maintenance Fee

where the Percent of License Fees is again determined by the desired support level and Total License Fee includes any adders for optional interfaces / capabilities defined in the Elster Software License Agreement or customer statement of work.

The Network Maintenance Fee is calculated as described in Exhibit J, Confidential Pricing Schedule, per AMI / AMR measurement, control, or sensing element, HAN / DR device, and DS / DA device as defined in the Elster Software License Agreement.

2. Additional per processor SMA fee: is described in Exhibit J, Confidential Pricing Schedule per additional processor for EnergyAxis Premiere and for EnergyAxis Advanced or Enterprise beyond the numbers of processors recommended by Elster as the proposed system configuration.

3. Un-embedded instances of Oracle database or Application software: SMA fees are based on embedded Standard Edition or Enterprise Edition Oracle database server and Oracle application server (if applicable in License's deployment). Additional fees will apply for use of Un-embedded Standard Edition or Enterprise editions of Oracle software.

4. Future Modules and Applications: Additional System Maintenance fees for new modules or applications will be determined at time of availability.

5. Annual Increase Provision: Licensor reserves the right to increase the annual SMA fee at the time of annual renewal each year after the 1st complete calendar year by the greater of 4% or the most recent Consumer Price Index for Urban Customers (CPI-U) statistic posted by the Bureau of Labor Statistics of the US Department of Labor.

6. Optional System Retraining: Licensee with a current System Maintenance Agreement can optionally purchase system retraining for 1 week under the following fee structure

a) Training at Licensor's Facility in Raleigh, NC: is described in Exhibit J Confidential Pricing Schedule plus a fee as described in Exhibit J Confidential Pricing Schedule per set of printed materials (a maximum of nine students in one package)

b) Training at Licensee's Facility: is described in Exhibit J, Confidential Pricing Schedule plus travel and living and an additional fee as described in Exhibit J, Confidential Pricing Schedule, per set of printed materials (a maximum of nine students in one package).

Pricing Notes:

1. If System maintenance is to be purchased for any licensee Management System Server, it must be purchased for ALL of the Licensee's Management System servers (operational, backup and test) and the hours of coverage for all Management System servers must be the same.

2. SMA support for any of Licensee's systems is only available if the all of the applicable license fees have been paid (including any incremental backup and/or system Software License fees), the system(s) installed and all of the Licensee's systems are under an active and paid SMA.

APPENDIX C-3

EA_MS Server System Maintenance Agreement

Professional Services Request Form

To:	Attn:	Date:
Elster Solutions, LLC 208 S. Rogers Lane Raleigh, NC 27610	Systems Support Manager Fax: (919) 250-5439	

WORK REQUESTED BY CUSTOMER: **(Attach additional page(s) if more space is required.)**

RATES: The rates quoted below apply to work initiated in year 2010 and completed within one (1) calendar year. Rates are for labor only and DO NOT include travel and living expenses.

Skill Category	Elster Daily Rate	Exemplary Activities
Program Director	**	Ultimate authority over Elster for large scale or turn key projects reporting to execute sponsors, Risk Mitigation consultation and decision making, Communications to Licensee's senior executives
Executive Consultant	**	Business and technical expertise to advise Licensee regarding AMI strategy, business case development, enterprise architecture and infrastructure planning and process evaluation
Senior Systems Engineer/ Architect/Senior Business Analyst	**	Technical expertise for business process analysis re-engineering and integration scoping for enterprise AMI integration
Solution Delivery Manager	**	Overall management responsibility for large scale or turn key projects reporting to executive sponsors
Project Manager	**	Planning and administration of day to day project activities, monitoring execution of project schedules, routine status reporting, communicating risk and issues
Integration Developer	**	Expertise in software tools and techniques that allow seamless sharing of AMI data and business processes across enterprise applications and disparate customer information systems
Project Engineer	**	Engineering expertise for ensuring the network elements, metering end points and hardware interfaces of the AMI system deployed function as intended to meet the specified AMI system requirements
Senior Field Service Engineer	**	Field installation coordination and field trouble shooting
Business Analyst/Support Analyst/Network Engineer	**	Definition and execution of system acceptance tests, on-going consultation on business process analysis and design, on-site support as defined in this agreement
Senior Database Administrator/ System Administrator/ Enterprise IT Architect	**	Planning and configuration of WAN communications, storage area networks, high availability options, etc. to meet Licensee's enterprise IT Requirements
Logistics Coordinator	**	Coordination of equipment and material delivery logistics
Systems Engineer/Senior Developer/ Senior QA Engineer	**	Implementation and test of any defined integrations within Elster scope
Technical Writer	**	Documentation of scope of implementation
Administrative Assistant	**	Assistance with administration of project

Unless otherwise stated herein, Service prices are based on normal business hours (8 a.m. to 5 p.m. Monday through Friday). "Time" is on-the-job plus travel time to and from the job site from the regularly assigned office location. "Time" starts and ends at the person's regularly assigned office location unless otherwise agreed upon prior to the start of work. Overtime, Saturday hours will be billed at one and one half (1 ½) times the hourly rate; Sunday will be billed at two (2) times the hourly rate and holiday hours recognized by Elster will be billed at three (3) times the hourly rate. Minimum billable time per person will be four (4) hours.

Send Invoices To:	Customer's Authorized Representative:
Company: **Address:** **City, State, Zip:** **Attn:** **Telephone No:**	 Signature Date

Request Received by Elster:	Enter Time Tracking System Task Name:

All services and products delivered under this request are governed exclusively by the Master Agreement.

(** As described in Exhibit J, Confidential Pricing Schedule)

EXHIBIT D
EQUIPMENT MAINTENANCE AGREEMENT
BETWEEN

Elster Solutions, LLC **208 South Rogers Lane** **Raleigh, North Carolina 27610**	**and**	**City of Santa Clara** **Silicon Valley Power** **1500 Warburton Avenue** **Santa Clara, California 95050**
("Elster" or "Seller")		**("Buyer")**

I. Introduction

The original Buyer of equipment (Equipment) listed in Section V. below, agrees to purchase an Equipment Maintenance Agreement (EMA) from Elster Solutions or its authorized agent. The EMA is not transferable to any other party without the written authorization from Elster Solutions.

II. Purchase Conditions

a) Equipment under original warranty. Provided there is no lapse in Equipment warranty coverage; an EMA is purchased prior to the conclusion of the standard new warranty period for the Equipment and will be automatically renewed annually until terminated by either party as provided in Section X.

b) Equipment no longer under original warranty. In the event there was a lapse of coverage either from the end of the new product warranty period or a lapse in EMA coverage, EMA coverage may be purchased or reinstated, subject to the conditions in Sections VI and VII, below and will be automatically renewed annually until terminated by either party as provided in Section X.

III. Maintenance Requests

To arrange Equipment Maintenance service under this Agreement, please contact Customer Service (888.757.1918) for a return material authorization number and shipping instructions.

IV. Maintenance Services

Elster will inspect Equipment upon receipt to determine the Equipment's eligibility status. Equipment that is either under original warranty or has current EMA coverage on the equipment is eligible for maintenance without charge. Repair may include the replacement of the parts or boards with functionally equivalent, reconditioned or new parts and boards. All parts and boards removed in the replacement process shall become the property of Elster. Buyer shall prepay shipping charges and insurance for Equipment returned to Elster under original warranty or EMA maintenance. Elster will pay costs for return of the Equipment to Buyer via ground service.

V. Equipment

The Equipment covered under this Agreement is listed in Attachment A attached and provided in this manner to allow addition and deletion of Equipment under EMA to be made without having to initiate a new EMA with each requirement.

VI. Term

a) The term of this EMA shall commence upon meeting the above Purchase Conditions and shall continue until December 31 of that effective year (the "Initial Term"). Thereafter, this EMA shall automatically renew for successive one-year renewal terms (each a "Renewal Term") unless the EMA is terminated by either party upon written notice within thirty (30) days of receipt of renewal invoice. Elster shall have the right to increase EMA Fees annually, provided Elster provides Buyer written notice of the increased fees no later than sixty (60) days prior to the end of the current calendar year.

b) The term for EMAs purchased for Equipment after the original equipment warranty has expired or EMA lapse will begin from the date the EMA is executed by Elster and the Buyer, and will extend for a period of 365 days. The Buyer may reinstate lapsed EMA coverage for Equipment upon payment of all costs invoiced by Elster for the inspection and reconditioning of Equipment to be reinstated.

VII. Fees and EMA Renewal

The fee for 365-day EMA coverage Term ("Maintenance Fee") is described in Exhibit J Confidential Pricing Schedule for each unit, for the next term. The eligibility inspection ("Inspection Fee") for Equipment previously purchased, but not covered by an EMA, is described in Exhibit J Confidential Pricing Schedule for each unit, for the next term. *Inspection fee does not apply to new equipment. This fee applies when an existing unit is not under an Equipment Maintenance Agreement and the Buyer decides to purchase this option. Fees are subject to periodic adjustment by Elster and may affect the next renewal term. Maintenance Fees are calculated based on the calendar year. Annual EMA Renewal Term Fees will be invoiced in October of each year for the subsequent year. On Site Support services and any other Additional Services will be billed at the end of the month in which the services are provided. All invoices are due net thirty (30) days from the date of invoice. Buyer will assess a late payment charge on any amount unpaid after it is due, computed at the rate equal to the lesser of one and one-half percent (1.5%) per month or the maximum amount permitted by law on the unpaid amount for each month that such amount remains unpaid. This late payment charge shall be in addition to any other remedies Elster may have at law or in equity. All EMA Fees are in US dollars.

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VIII. Manufacturers Warranty

Elster warrants that maintenance services will be performed in a good and workmanship manner. Replacement parts and boards are warranted for ninety (90) days or the balance of the EMA Term, whichever is longer. There is no warranty or guaranty of merchantability, or fitness for a particular purpose, or of any other kind, expressed or implied, with respect to the services performed or parts furnished by Elster. This EMA does not cover defects, malfunctions, performance failures or damages to the unit resulting from use in other than normal and customary manner, misuse, accident, neglect, improper alterations or repairs. Unauthorized disassembly or repairs of the Equipment by anyone other than Elster or its authorized representative will void this EMA. The misuse or neglect of the Equipment resulting in water and/or physical damage will void this EMA.

IX. Limited Liability

The following sets forth the full extent of Elster Solutions' responsibilities with regard to any Equipment covered by an EMA. Repair or refund of the Maintenance Fee paid for the particular Equipment that can't be repaired, solely at Elster Solutions' option, is the exclusive remedy under an EMA. In no event shall Elster Solutions be liable for damages in excess of the original price paid for the current Term Maintenance Fee for the Equipment, or for any loss of use, loss of time, inconvenience, commercial loss, lost profits or savings or other incidental, special or consequential damages arising out of the use or inability to use such product, to the full extent such may be disclaimed by law.

X. Termination

If Elster Solutions determines that it can no longer maintain certain Equipment, Elster Solutions shall have the right to cancel any current EMA coverage of that Equipment and refund the Buyer the full Term Maintenance Fee for each covered Equipment provided it has not been repaired during the current Term. If the Equipment has been repaired during the current Term, the total annual Maintenance Fee will be refunded, less the cost of any repairs occurring in the current Term.

This Equipment Maintenance Agreement shall be construed and governed according to the laws of the State of California without regard to the choice of law or conflicts of law rules of any jurisdiction.

(continued on page 4)

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This Agreement, together with the Exhibit incorporated herein by reference, as well as all purchase orders issued hereunder, sets forth the entire agreement between Seller and Buyer concerning the subject matter hereof.

IN WITNESS WHEREOF, the parties have caused their duly authorized representatives to execute this Equipment Maintenance Agreement.

CITY OF SANTA CLARA, CALIFORNIA
A chartered California municipal corporation

APPROVED AS TO FORM:

ELIZABETH H. SILVER
Interim City Attorney

ATTEST:

RON DIRIDON, JR.
City Clerk

JENNIFER SPARACINO
City Manager
1500 Warburton Avenue
Santa Clara, CA 95050
Telephone : 408-615-2210
Fax : 408-241-6771

ELSTER SOLUTIONS, LLC
a Delaware limited liability corporation

By: H.N. KLETT
Title: Vice President, Business Development
Address: 208 S. Rogers Lane
Raleigh, NC 27610
Telephone: 919-212-4875
Facsimile: 919-250-5483

Attachment A

EMA Equipment	EMA Fee
EA_Inspector (FW900 and/or FW950)[1]	** per unit
EA_Inspector - 7S1500G002	
Serial number(s)	
1	
2	
3	

Total added to Contract: _____

PI900 (FW900 and/or FW950)[1]	** per unit
PI 900 - 7S1500G001	
1	
2	
3	

Total added to Contract: _____

(** As described in Exhibit J Confidential Pricing Schedule)

Note 1: The EA_Inspector may optionally have the PI 900 application installed. In these "dual load" cases, a single EA_Inspector EMA fee is charged.

CITY OF SANTA CLARA, CALIFORNIA
A chartered California municipal corporation

APPROVED AS TO FORM:

_____
Elizabeth H. Silver
Interim City Attorney

ATTEST:

_____
RON DIRIDON, JR.
City Clerk

_____
JENNIFER SPARACINO
City Manager
1500 Warburton Avenue
Santa Clara, CA 95050
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By: _____
H.N. KLETT
Title: Vice President, Business Development
Address: 208 S. Rogers Lane
Raleigh, NC 27610
Telephone: 919-212-4875
Facsimile: 919-250-5483

EXHIBIT E

INSURANCE REQUIREMENTS

Without limiting the Contractor's indemnification of the City, and prior to commencing any of the Services required under this Agreement, the Contractor shall purchase and maintain in full force and effect, at its sole cost and expense, the following insurance policies with at least the indicated coverages, provisions and endorsements:

A. COMMERCIAL GENERAL LIABILITY INSURANCE

1 Commercial General Liability Insurance policy which provides coverage at least as broad as Insurance Services Office form CG 00 01. Policy limits are subject to review, but shall in no event be less than, the following:

$2,000,000 Each occurrence
$2,000,000 General aggregate
$2,000,000 Products/Completed Operations aggregate
$2,000,000 Personal Injury

2. Exact structure and layering of the coverage shall be left to the discretion of Contractor; however, any excess or umbrella policies used to meet the required limits shall be at least as broad as the underlying coverage and shall otherwise follow form.

3. The following provisions shall apply to the Commercial Liability policy as well as any umbrella policy maintained by the Contractor to comply with the insurance requirements of this Agreement:

a. Coverage shall be on a "pay on behalf" basis with defense costs payable in addition to policy limits;

b. There shall be no cross liability exclusion which precludes coverage for claims or suits by one insured against another; and

c. Coverage shall apply separately to each insured against whom a claim is made or a suit is brought, except with respect to the limits of liability.

B. BUSINESS AUTOMOBILE LIABILITY INSURANCE

Business automobile liability insurance policy which provides coverage at least as broad as ISO form CA 00 01 with policy limits a minimum limit of not less than one million dollars ($1,000,000) each accident using, or providing coverage at least as broad as, Insurance Services Office form CA 00 01. Liability coverage shall apply to all owned, non-owned and hired autos.

In the event that the Work being performed under this Agreement involves transporting of hazardous or regulated substances, hazardous or regulated wastes and/or hazardous or regulated materials, Contractor and/or its subcontractors involved in such activities shall provide coverage with a limit of two million dollars ($2,000,000) per accident covering transportation of such materials by the addition to the Business Auto Coverage Policy of Environmental Impairment Endorsement MC S90 or Insurance Services Office endorsement form CA 99 48, which amends the pollution exclusion in the standard Business Automobile Policy to cover pollutants that are in or upon, being transported or towed by, being loaded onto, or being unloaded from a covered auto.

C. WORKERS' COMPENSATION

1 Workers' Compensation Insurance Policy as required by statute and employer's liability with limits of at least one million dollars ($1,000,000) policy limit Bodily Injury by disease, one million dollars ($1,000,000) each accident/Bodily Injury and one million dollars ($1,000,000) each employee Bodily Injury by disease.

2. The indemnification and hold harmless obligations of Contractor included in this Agreement shall not be limited in any way by any limitation on the amount or type of damage, compensation or benefit payable by or for Contractor or any subcontractor under any Workers' Compensation Act(s), Disability Benefits Act(s) or other employee benefits act(s).

This policy must include a Waiver of Subrogation in favor of the City of Santa Clara, its City Council, commissions, officers, employees, volunteers and

D. COMPLIANCE WITH REQUIREMENTS

All of the following clauses and/or endorsements, or similar provisions, must be part of each commercial general liability policy, and each umbrella or excess policy.

1. Additional Insureds. City of Santa Clara, its City Council, commissions, officers, employees, volunteers and agents are hereby added as additional insureds in respect to liability arising out of Contractor's work for City, using Insurance Services Office (ISO) Endorsement CG 20 10 11 85 or the combination of CG 20 10 03 97 and CG 20 37 10 01, or its equivalent.

2. Primary and non-contributing. Each insurance policy provided by Contractor shall contain language or be endorsed to contain wording making it primary insurance as respects to, and not requiring contribution from, any other insurance which the

Indemnities may possess, including any self-insurance or self-insured retention they may have. Any other insurance Indemnities may possess shall be considered excess insurance only and shall not be called upon to contribute with Contractor's insurance.

3. General Aggregate. The general aggregate limits shall apply separately to Contractor's work under this Agreement providing coverage at least as broad as Insurance Services Office (ISO) Endorsement CG 2503, 1985 Edition, or insurer's equivalent (CGL);

4. Cancellation.

a. No cancellation of the coverage provided due to nonpayment of premiums shall be effective until written notice has been given to City at least ten (10) days prior to the effective date of such modification or cancellation. In the event of non-renewal, written notice shall be given at least ten (10) days prior to the effective date of non- renewal.

b. No cancellation of the coverage provided for any cause save and except non-payment of premiums shall be effective until written notice has been given to City at least thirty (30) days prior to the effective date of such modification or cancellation. In the event of non-renewal, written notice shall be given at least thirty (30) days prior to the effective date of non-renewal.

c. Other Endorsements. Other endorsements may be required for policies other than the commercial general liability policy if specified in the description of required insurance set forth in Sections A through D of this Exhibit C, above.

E. ADDITIONAL INSURANCE RELATED PROVISIONS

Contractor and City agree as follows

1. Contractor agrees to ensure that subcontractors, and any other party involved with the Services who is brought onto or involved in the performance of the Services by Contractor, provide the same minimum insurance coverage required of Contractor, except as with respect to limits. Contractor agrees to monitor and review all such coverage and assumes all responsibility for ensuring that such coverage is provided in conformity with the requirements of this Agreement. Contractor agrees that upon request by City, all agreements with, and insurance compliance documents provided by, such subcontractors and others engaged in the project will be submitted to City for review.

2. Contractor agrees to be responsible for ensuring that no contract used by any party involved in any way with the project reserves the right to charge City or Contractor for the cost of additional insurance coverage required by this Agreement. Any such provisions are to be deleted with reference to City. It is not the intent of City to reimburse any third party for the cost of complying with these requirements. There shall be no recourse against City for payment of premiums or other amounts with respect thereto.

F. EVIDENCE OF COVERAGE

Prior to commencement of any Services under this Agreement, Contractor, and each andevery subcontractor (of every tier) shall, at its sole cost and expense, purchase and maintain not less than the minimum insurance coverage with the endorsements and deductibles indicated in this Agreement. Such insurance coverage shall be maintained with insurers, and under forms of policies, satisfactory to City and as described in this Agreement. Contractor shall file with the City all certificates and endorsements for the required insurance policies for City's approval as to adequacy of the insurance protection.

G. EVIDENCE OF COMPLIANCE

Contractor or its insurance broker shall provide the required proof of insurance compliance, consisting of Insurance Services Office (ISO) endorsement forms or their equivalent and the ACORD form 25-S certificate of insurance (or its equivalent), evidencing all required coverage shall be delivered to City, or its representative as set forth below, at or prior to execution of this Agreement. Upon City's request, Contractor shall submit to City copies of the actual relevant portions of the insurance policies or renewals or replacements. Unless otherwise required by the terms of this Agreement, all certificates, endorsements, coverage verifications and other items required to be delivered to City pursuant to this Agreement shall be mailed to:

City of Santa Clara Electric Department
c/o EBIX Inc.
P.O. 12010-S2 or 151 North Lyon Avenue
Hemet, CA 92546-8010 Hemet, CA 92543
Telephone number: 951-766-2280
Fax number: 770-325-0409

F. QUALIFYING INSURERS

All of the insurance companies providing insurance for Contractor shall have, and provide written proof of, an A. M. Best rating of at least A minus 6 (A- VI) or shall be an insurance company of equal financial stability that is approved by the City or its insurance compliance representatives.

AGREEMENT BY AND BETWEEN
THE CITY OF SANTA CLARA, CALIFORNIA
AND
ELSTER SOLUTIONS, LLC

EXHIBIT F

ETHICAL STANDARDS FOR CONTRACTORS SEEKING TO ENTER INTO AN AGREEMENT WITH THE CITY OF SANTA CLARA, CALIFORNIA

Termination of Agreement for Certain Acts

A. City may, at its sole discretion, terminate this Agreement in the event any one or more of the following occurs:

1. If a Contractor[1] does any of the following:

   a. Is convicted[2] of operating a business in violation of any Federal, State or local law or regulation;

   b. Is convicted of a crime punishable as a felony involving dishonesty[3];

   c. Is convicted of an offense involving dishonesty or is convicted of fraud or a criminal offense in connection with: (1) obtaining; (2) attempting to obtain; or, (3) performing a public contract or sub-contract;

   d. Is convicted of any offense which indicates a lack of business integrity or business honesty which seriously and directly affects the present responsibility of a City Contractor or sub-contractor; and/or,

   e. Made (or makes) any false statement(s) or representation(s) with respect to this Agreement.

2. If fraudulent, criminal or other seriously improper conduct of any officer, director, shareholder, partner, employee or other individual associated with the Contractor can be imputed to the Contractor when the conduct occurred in connection with the individual's performance of duties for or on behalf of the

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[1] For purposes of this Agreement, the word "Contractor" (whether a person or a legal entity) means any of the following: an owner or co-owner of a sole proprietorship; a person who controls or who has the power to control a business entity; a general partner of a partnership; a principal in a joint venture; or a primary corporate stockholder [i.e., a person who owns more than ten percent (10%) of the outstanding stock of a corporation] and who is active in the day to day operations of that corporation.

[2] For purposes of this Agreement, the words "convicted" or "conviction" mean a judgment or conviction of a criminal offense by any court of competent jurisdiction, whether entered upon a verdict or a plea, and includes a conviction entered upon a plea of nolo contendere within the past five (5) years.

[3] As used herein, "dishonesty" includes, but is not limited to, embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, failure to pay tax obligations, receiving stolen property, collusion or conspiracy.

Contractor, with the Contractor's knowledge, approval or acquiescence, the Contractor's acceptance of the benefits derived from the conduct shall be evidence of such knowledge, approval or acquiescence.

B. City may also terminate this Agreement in the event any one or more of the following occurs:

1. If City determines that Contractor no longer has the financial capability[4] or business experience[5] to perform the terms of, or operate under, this Agreement; or

2. If City determines that the Contractor fails to submit information, or submits false information, which is required to perform or be awarded a contract with city, including, but not limited to, Contractor's failure to maintain a required State issued license, failure to obtain a City business license (if applicable) or failure to purchase and maintain bonds and/or insurance policies required under this Agreement.

C. In the event a prospective Contractor (or bidder) is ruled ineligible (debarred) to participate in a contract award process or a contract is terminated pursuant to these provisions, Contractor may appeal City's action to the City Council by filing a written request with the City Clerk within ten (10) days of the notice given by City to have the matter heard. The matter will be heard within thirty (30) days of the filing of the appeal request with the City Clerk. The Contractor will have the burden of proof on the appeal. The Contractor shall have the opportunity to present evidence, both oral and documentary, and argument.

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[4] Contractor becomes insolvent, transfers assets in fraud of creditors, makes an assignment for the benefit of creditors, files a petition under any section or chapter of the federal Bankruptcy Code [11 U.S.C.], as amended, or under any similar law or statute of the United States or any state thereof, is adjudged bankrupt or insolvent in proceedings under such laws, or a receiver or trustee is appointed for all or substantially all of the assets of Contractor.

[5] Loss of personnel deemed essential by the City for the successful performance of the obligations of the Contractor to the City.

AGREEMENT BY AND BETWEEN
THE CITY OF SANTA CLARA, CALIFORNIA
AND
ELSTER SOLUTIONS, LLC

EXHIBIT G

AFFIDAVIT OF COMPLIANCE WITH ETHICAL STANDARDS
[CITY OF SANTA CLARA]

I, H. N. Klett, being first duly sworn, depose and say that I am the Vice President, Business Development of Elster Solutions, LLC, and I hereby state that I have read and understand the language, entitled *"ETHICAL STANDARDS FOR CONTRACTORS SEEKING TO ENTER INTO AN AGREEMENT WITH THE CITY OF SANTA CLARA, CALIFORNIA"* (herein "Ethical Standards") set forth in Exhibit A. I have authority to make these representations on my own behalf or on behalf of the legal entity identified herein. I have examined appropriate business records and I have made inquiry of those individuals potentially included within the definition of "Contractor" contained in the Ethical Standards.

Based on my review of the appropriate documents and the necessary inquiry responses, I hereby state that neither the business entity nor any individual(s) belonging to a category identified in footnote #1 of Exhibit A [i.e., owner or co-owner of a sole proprietorship, general partner, person who controls or has power to control a business entity, etc.] has been convicted of any one or more of the crimes identified in Exhibit A within the past five (5) years. The above assertions are true and correct and are made under penalty of perjury under the laws of the State of California.

ELSTER SOLUTIONS, LLC
a Delaware limited liability corporation

By: _____
H. N. KLETT
Title: Vice President, Business Development

NOTARY'S ACKNOWLEDGMENT TO BE ATTACHED

Please execute the affidavit and attach a notary public's acknowledgment of execution of the affidavit by the signatory. If the affidavit is on behalf of a corporation, partnership, or other legal entity, the entity's complete legal name and the title of the person signing on behalf of the legal entity shall appear above. Written evidence of the authority of the person executing this affidavit on behalf of a corporation, partnership, joint venture, or any other legal entity, other than a sole proprietorship, shall be attached.

NOTARIAL CERTIFICATE FOR ACKNOWLEDGMENT

Wake County, North Carolina

I certify that the following person(s) personally appeared before me this day, each acknowledging to me that he or she signed the foregoing document:

H. N. Klett

Name(s) of principal(s)

Date: 11/15/10

(Official Seal)

SHERI L RIEVES
Notary Public
Wake County
North Carolina
My Commission Expires Jun 26, 2015

Sheri L Rieves

Official Signature of Notary

Sheri L. Rieves, Notary Public

Notary's printed or typed name

My commission expires: 6-26-2015

EXHIBIT H

System Functional and Non Functional Requirements

The following requirements were presented in the RFP dated November, 2009. The requirements are restated in a form to allow for specific testing and compliance as a part of the agreement.

6.1 MANDATORY FUNCTIONAL REQUIREMENTS

The Supplier, Elster, shall provide a complete Advanced Metering System, known as Energy Axis Management System (EA_MS), including field communication hardware, electrical and water meters, Elster REX2, A3 ALPHA, AMCO, and support equipment and software as specified in the following requirements below:

6.1.0 AMI Solution – General

Supplier shall provide an AMI Solution system that can:

6.1.0.1	Handle up to 100,000 residential, commercial and industrial electric meters.	PR
6.1.0.2	Handle up to 50,000 residential and non-residential water meters.	PR
6.1.0.3	Handle up to 5,000 water distribution system meters and devices.	PR
6.1.0.4	Handle up to 10,000 electric distribution meters, grid sensors, controller, collectors and other endpoint devices.	PR
6.1.0.5	Receive and process more than 500,000 endpoint values up to six (6) times a day – channels or endpoints only.	PR
6.1.0.6	Handle up to 20,000 net metering points.	PR

6.1.1 Meters

6.1.1.1 Meters – Electric, General

Supplier shall provide electric meters that meet the following requirements:

6.1.1.1.1	Shall comply with applicable U.S. meter standard for induction and solid state watt-hour meters and communication standards including: 1. ANSI C12.1-2001 2. ANSI C12.20 (Class 0.2) – 2002 3. ANSI/IEEE C37.90.1 - 2002 4. ANSI/IEEE 62.45 – 2002 5. ANSI C12.10 – 2004 6. ANSI C12.18 – 1996 7. ANSI C12.19 – 1997	FR

	8. ANSI C12.21 9. ANSI C12.22 10. IEC 61000-4-4 – 2004-07 11. IEC 61000-4-2 – 2001-04 12. IETF IPv4 13. Support for latest revision of above standards where applicable. 14. Comply with FCC regulations (provide documentation of compliance with proposal response) 15. FCC Part 15 Class B **16.** FCC Part 15, sub-paragraph 247	
6.1.1.1.2	Supplier shall provided the following electric meter quantities and types of electric meters to be procured and installed with this RFP (numbers also include spares): 3980 2S - Single Phase 3 Wire Meter 11 3S - Single Phase 3 Wire Meter w/ Single CT 30 5S - Three Phase Transformer Rated 3 Wire Meter Delta w/Demand 164 9S - Three Phase Transformer Rated 4 Wire Meter Wye w/Demand 854 12S - Network Meter From 3Wire Meter 145 16S - Three Phase Self-Contained Meter	FR
6.1.1.1.3	Shall provide Elster electric meters or acceptable equivalent from the following manufacturers include: 1. GE 2. Landis&Gyr 3. Itron	FR
6.1.1.1.4	Shall store 15 minute interval energy consumption data for a minimum of 55 days for 1 channel and 27 days for two (2) channels. Data to persist until overwritten.	PR
6.1.1.1.5	Shall store at least the last 100 diagnostic events/errors in a log with a timestamp indicating the occurrence of the event/error. Data to persist until overwritten.	PR
6.1.1.1.6	Shall store at least the last 100 informational messages in a log with a timestamp indicating the receipt of the message. Data to persist until overwritten.	PR
6.1.1.1.7	The HES shall store at least the last 512 communications events in a log with a timestamp indicating the occurrence of the event. Data to persist until overwritten.	PR
6.1.1.1.8	Shall provide two-way secure communication with authorized systems and devices. Meter shall be capable of transmitting stored data to Responder supplied Field Tool locally and to AMI Head-End System (HES) .	FR

6.1.1.1.9	The Supplier provided REX2 electric meter shall be capable of displaying 6 digits on its LCD. The energy (kWh) information shall be configurable for 4, 5 or 6 significant digits with no decimal. The demand (kW) information shall be displayable as a 3 digits plus 3 decimals. The A3 ALPHA meter shall be capable of displaying 6 digits on its LCD. Both energy (kWh) and demand (kW) information shall be configurable from 3 to 6 significant digits with up to 4 decimal locations.	FR
6.1.1.1.10	Shall possess a unique internal (e.g. serial number) and external (e.g. network address) identity to enable targeted messaging and communications (i.e. individually addressable meters and distribution devices).	FR
6.1.1.1.11	Shall continue to record data (energy usage, diagnostic events, and informational messages) during a communications failure/outage.	FR
6.1.1.1.12	Shall provide an integrated 200A remote connect/disconnect switch on the REX2 meter for all 200A residential and network electric meters.	FR
6.1.1.1.13	Shall externally indicate electric service connect/disconnect status so that it is visible to customer or SVP employee on site.	FR
6.1.1.1.14	Supplier shll provide electric meters that have a projected minimum service life of 20 years including battery, with a meter failure rate of less than 0.3% per year.	PR
6.1.1.1.15	Shall have a viewable liquid crystal display (LCD) in full daylight with meter register visible at 25ft., with viewing angle of +/- 60 degrees.	PR

6.1.1.2 Meters – Electric, Functions

Supplier shall provide electric meters that meet the following requirements:

6.1.1.2.1	REX2 meter shall support previous billing register. A3 ALPHA meter shall be able to record self reads at 12 midnight for each register or channel.	FR
6.1.1.2.2	Shall be able to support interval data collection for energy consumption, kWh, for interval data lengths of 15, 30, or 60 minutes or one single daily interval 24 hours in length for the REX2 electric meters. The interval length for the A3 ALPHA meter is configurable between 1 to 60 minutes where the length is evenly divisible into 60. Expected interval data length will be 15 minutes for all meters.	PR
6.1.1.2.3	Shall be able to support a minimum of two (2) channels of interval data for residential meters (REX2). Shall be able to support a minimum of four (4) channels for commercial and industrial meters (A3 ALPHA).	FR

6.1.1.2.4	HES shall provide the capability to schedule reads of voltage data from a subset of the REX2 meters on a periodic basis as frequently as every 15 minutes.	FR
6.1.1.2.5	Shall be able to support measurement of peak demand kW over a configurable demand period for both the residential, REX2, and commercial and industrial, A3 ALPHA, electric meters. The A3 ALPHA meter is also configurable to display the instantaneous kW value.	FR
6.1.1.2.6	Meter recording interval length shall be configurable.	FR
6.1.1.2.7	Shall support net metering By measuring kWh consumption/generation on one (1) billing register. Meter shall record load profile as kWh-delivered and kWh-received.	FR
6.1.1.2.8	Shall support bi-directional metering to support distributed generation measurement. The electric meter shallecord kWh consumption/generation on two (2) channels. This shall be provided to support distributed generation applications where SVP needs to measure both the gross premises load and energy generated. Information from two channels shall be used to determine net energy received from/sent to utility.	FR
6.1.1.2.9	Shall support power outage flag that can be set for each interval in which a power outage occurs.	FR
6.1.1.2.10	Large commercial and industrial electric meters, A3 ALPHA, shall have pulse contact KYZ output relays for backwards compatibility with existing customer energy management systems or other users of pulse output.	FR
6.1.1.2.11	Non-residential, non-self-contained electric meters shall support multi-voltage with ratio settings for input current transformers (CTs)/potential transformers (PTs) from 120V to 480V.	FR
6.1.1.2.12	Non-residential electric meter shall support interval data collection for VArHr (Volt Ampere-reactive Hour) .	FR
6.1.1.2.13	Shall keep a log of communications events at the HES, but not limited to: 1. Link fail 2. Link switch 3. Link up 4. Link quality	FR
6.1.1.2.14	Time clock in the electric meter shall be validated with an external time source at least once per day. Originating source shall be traceable to NIST time standard.	FR
6.1.1.2.15	Electric meter clock time shall be automatically reset during the daily time validation if meter time is out of synch (based upon set limits) with the external time source.	FR

6.1.1.2.16	Shall correct for Daylight Savings Time (DST) changes twice per year.	FR
6.1.1.2.17	EA_MA shall log all successful and failed internal clock time corrections or adjustments. Based on user-defined parameters, EA_MS shall perform one of the following functions: 1) Determine that the electric meter's internal clock is within allowable limits; 2) Determine that the electric meter's clock is off, but within allowable limits, and correct the meter's time; or 3) Determine that the electric meter's clock is significantly off, and not correct the meter's time. This would generate an error report so that the electric meter can be checked or possibly replaced.	FR
6.1.1.2.18	Shall have time keeping capability and maintain holdover accuracy to ANSI C12.1 specifications. For meters without battery backup, the real time shall be provided via the AMI network.	FR
6.1.1.2.19	Shall be able to be remotely disconnect/reconnect premises electrical service for residential customers upon receipt of authorized AMI system message.	FR
6.1.1.2.20	Shall support tamper detection and set tamper detection flag for reporting during next scheduled read.	FR
6.1.1.2.21	Shall detect presence of voltage on customer side of electric meter when remote connect/disconnect switch is open. Electric meter shall set voltage present/switch open flag for reporting during next scheduled read. This flag shall be used to flag potential energy theft.	

6.1.1.3 Meters – Water, General

Supplier shall provide water meters that meet the following requirements:

6.1.1.3.1	Shall comply with applicable U.S. meter standards for water meters and communication standards including: 1. AWWA C700 2. NSF/ANSI 61 3. Comply with FCC regulations (Supplier shall provide documentation of compliance) 4. FCC Part 15 Class B 5. FCC Part 15, sub-paragraph 247	FR

6.1.1.3.2	Supplier shall provided the following quantities and types of water meters to be procured and installed with this RFP (numbers also include spares): 456 5/8 x 3/4 inch Remote Meter – Positive Displacement 6 5/8 x 3/4 inch Pit Meter – Positive Displacement 25 1 inch Pit Meter – Positive Displacement 15 1 1/2 inch Positive Displacement Pit Meter – Multi-jet, Turbine 26 2 inch Positive Displacement Pit Meter – Multi-jet, Turbine	FR
6.1.1.3.3	Shall be sealed and waterproofed.	FR
6.1.1.3.4	Shall be lead free per CA AB 1953.	FR
6.1.1.3.5	Shall provide water meters or AMI modules for the following water meter manufacturers: 1. Elster AMCO 2. Badger Meters 3. Sensus	FR
6.1.1.3.6	Shall have a projected minimum service life of 20 years including battery when reporting every 4 hours, 16 years when reporting every 2 hours, and 15 years of operation when reporting every 1 hour. Water meter failure rate shall be equal to or less than 0.3% per year.	PR
6.1.1.3.7	Shall store fifteen minute interval water consumption data for a minimum of 24 days for one channel. Data shall persist until overwritten.	PR
6.1.1.3.8	Shall provide two-way secure communication with authorized systems and devices.	FR
6.1.1.3.9	Shall have measurement resolution of one (1) gallon for water consumption.	PR
6.1.1.3.10	Shall possess a unique internal (e.g. serial number) and external (e.g. network address) identity to enable targeted messaging and communications (i.e. individually addressable meters).	FR
6.1.1.3.11	Shall confirm ability to transmit water consumption reads from SVP water meter pits to FAN Controller/Collector using transmission message acknowledgement from the FAN Controller/Collector. Provide transmission range for water meters set in pit, directly or indirectly	FR
6.1.1.3.12	Water meters shall be able to optimize signal transmission by using polycarbonate pit cover with a thickness of no more than 1".	FR
6.1.1.3.13	SVP shall be able to visually read water meter consumption inside pit upon removal of cover.	FR

6.1.1.4 Meters – Water Meter, Functions

Supplier shall provide water meters that meet the following requirements:

6.1.1.4.1	Shall Support measurement of interval water consumption.	FR
6.1.1.4.2	Sahll Support interval data lengths of 15, 30, or 60 minutes or one single daily interval of 24 hours in length.	PR
6.1.1.4.3	Shall provide "wake up" mode operation to maximize battery life.	FR
6.1.1.4.4	Shall provide peak detection alarm and support reverse flow detection alarm in the future.	FR
6.1.1.4.5	Shall provide battery-end-of-life indicator alarm.	FR
6.1.1.4.6	Shall provide alarm for communication failure with meter encoder.	FR
6.1.1.4.7	Shall provide tamper detection by setting a tamper detection flag and report this flag with the scheduled water meter read.	FR

6.1.1.5 Meters –Distribution, Grid Sensors and Controllers

Supplier shall provide Distribution meters, grid sensors and controller that meet the following requirements:

6.1.1.5.1	Comply with applicable utility standards for field installation of equipment and communication standards including: 1. ANSI/IEEE C37.90.1 - 2002 2. ANSI/IEEE 62.45 – 2002 3. IEC 61000-4-4 – 2004-07 4. IEC 61000-4-2 – 2001-04 5. FCC Part 15 Class B 6. FCC Part 15, sub-paragraph 247 7. IETF IPv4 8. Comply with FCC regulations (Supplier shall provide documentation of compliance) 9. Support for latest revision of above standards where applicable.	FR
6.1.1.5.2	Shall be able to support digital output such as KYZ relays.	FR
6.1.1.5.3	AMI solution shall support DA gateway in the future providing IP access (but not executing operations) to distribution devices and serving as 900 MHz EnergyAxis gatekeeper.	FR
6.1.1.5.4	Shall store 15 minute interval data for a minimum of 55 days for 1 channel and 27 days for 2 channels for REX2 technology. Monitoring device using the A3 ALPHA technology can store 15 minute interval data for 64 days for 2 channels.. Data to persist until overwritten.	PR

6.1.1.5.5	Shall provide two-way secure communication with authorized systems and devices.	FR
6.1.1.5.6	Shall possess a unique internal (e.g. serial number) and external (e.g. network address) identity to enable targeted messaging and communications (i.e. individually addressable meters).	FR
6.1.1.5.7	Shall continue to record data during a communications failure/outage.	FR
6.1.1.5.8	Shall respond to a request from an authorized source for presence of input voltage (device power).	FR
6.1.1.5.9	When a Distribution Meter replies to a request for voltage, it shall report: 1) timestamp, and 2) voltage.	FR
6.1.1.5.10	Shall operate off voltages between 96V to 144V (120V version) or 192V to 288V (240 V version) for REX2 technology. Monitoring device using the A3 ALPHA technology shall operate between 96V to 528V	PR
6.1.1.5.11	This requirement is deleted.	PR
6.1.1.5.12	Shall support the following distribution and/or other end point devices including, but not limited to: 1. Monitoring LV overhead distribution transformers 2. • Monitoring LV underground distribution transformers 3. • Remote control of polyphase loads	FR
6.1.1.5.13	As part of system acceptance testing, Supplier shall demonstrate functionality of five (5) different distribution meters, grid sensors and controllers for testing on SVP's installed AMI network in order to show successful system integration, testing and verification of operation. These are specified as follows: 1. Low Voltage AGInode for overhead distribution transformer 2. Low Voltage AGInode for pad mount distribution transformer 3. Polyphase AGI Remote Load Control for 100A load 4. Polyphase AGI remote load control for 200A load 5. AGI DA Gateway	PR

6.1.2 Field Area Network (FAN)

6.1.2.1 FAN – General

Supplier shall provide a Field Area Network (FAN) that meets the following requirements:

6.1.2.1.1	Shall comply with FCC regulations provide documentation of compliance and communications standards including: 1. FCC Part 15 Class B 2. FCC Part 15, sub-paragraph 247 3. IETF TCP/UDP 4. IETF TCP/IPv4 for Energy Axis 5. IETF TCP/IPv6 for Tropos GridCom	PR
6.1.2.1.2	Shall be modular to permit change of network communications technology.	FR
6.1.2.1.3	Energy Axis network design shall be self registering, self healing and self optimizing. • Self-registration within the EnergyAxis RF LAN shall allow the network to recognize and determine the best communication path for newly installed devices. The self-registration process shall allow the end device to find and register with the appropriate collector and provide notification to the EA_MS of newly installed devices. This shall happen automatically and without need for manual intervention. • To ensure robust communication within the RF LAN, each EnergyAxis end-device shall have the capability to self-optimize its communication path when initially registering or if communications degrade. The self-optimization of the EnergyAxis RF mesh will prevent many of the potential communication failures through early detection of communication degradation. The collector's LAN management algorithm shall be used remotely to optimize communications to each meter. Self-healing is the intelligence within the network to maintain communication with the end device and to find another path through the network when communications fail. This important feature shall not require interaction from the user. A temporary failure in the mesh network may result in a new communication path through a different series of repeaters to the same collector or to another collector.	FR

	Device Registration Process Each EnergyAxis meter shall be configured with a unique LAN ID and mapped to a Meter ID during manufacturing. The manufacturing system shall produce a "marriage file" that contains this mapping of LAN IDs to Meter IDs. The marriage file information shall be imported into the EAMS to provide a list of known and valid meters. These are the meters known to the network and alerts are generated if an unknown meter is found or if a known meter fails to register. These reports shall provide cross checks that the work order process during meter installation occurs properly. For example, the Unknown Meter Report will flag a meter that was installed but that the technician failed to identify as completed. The collector shall be installed according to the project plan and the communications ID shall be associated with the meter/collector ID. (Examples of communications IDs include IP addresses and telephone numbers.) This data shall be input into the EA_MS either manually or via an automatic CIS import. The RF node registration process functionality shall be provided by system algorithms developed by Elster. All system registration operations shall be transparent to the EnergyAxis EA_MS operator but visible if needed for operation or maintenance. The end meter/node registration process begins at the collector. Once energized, the collector: 1. Initiates a meter/node scan. 2. Finds and registers new "unregistered" meters/nodes. 3. Switches registered meters/nodes to better communications paths. The process shall start with the "closest" meters/nodes and then moves outward. Tropos GridCom network shall be self-initializing, self-healing and self-optimizing. Tropos' PWRP routing protocol shall be a real-time fully-distributed routing protocol that allows each mesh router to dynamically and automatically select the best routing path back to a backhaul point so as to minimize the end-to-end latency. The self-healing mesh architecture shall be capable of reacting and re-configuring over sub-second time scales to adapt to changes in network or RF conditions to continue to maintain service. It shall dynamically react to changes in RF environmental conditions to continually optimize end-to-end latency and throughput. All radio-level parameters, including operating channel, frequency bands, transmit power levels and modulation rates shall be under the control of automated algorithms that can react and respond in real-time to optimize the system performance.	

6.1.2.2 FAN Controller/Collector – General

Supplier shall provide FAN Controller/Collector that meets the following requirements:

6.1.2.2.1	EA Gatekeeper shall operate for extended periods in the absence of grid power for at least eight (8) hours . Tropos mesh routers, when equipped with optional battery backup, shall operate for extended periods in the absence of grid power for at least two (2) hours.	PR
6.1.2.2.2	Field equipment shall be hardened to operate in a noisy electrical environment. Supplier shall provide their certifications for Electromagnetic Compatibility. The REX2-EA meter supports: • ANSI C12.1 (2001) • ANSI C12.10 (2004) • ANSI C12.19 (1997) • ANSI C12.20 (2002) – 0.5 accuracy class • ANSI C37.90.1 Oscillatory • IEC 61000-4-4 • IEC 61000-4-2 The A3 ALPHA meter supports: • ANSI C12.1 (2001) • ANSI C12.10 (2004) • ANSI C12.18 • ANSI C12.19 (1997) • ANSI C12.20 (2002) – 0.2 accuracy class • ANSI C37.90.1 Oscillatory • IEC 61000-4-4 • IEC 61000-4-2 Tropos GridCom system • IEC 61000-4-2 as well as • ANSI/IEEE C62.41 • ANSI C37.90.1 Oscillatory	PR

	• UL 1449-2nd ed., 10kA @8/20 µS Wave form, 36kA per phase, L-L, L-N, L-PE, • EN61000-4-5 Level 1 & 2 AC Surge Immunity • EN61000-4-4 Level 2 Electrical Fast Transient Burst Immunity • EN61000-4-3 Level 2 EMC Field Immunity • EN61000-4-2 Level 2 (contact), Level 3 (air) ESD immunity.	
6.1.2.2.3	HES shall support self-healing capability such that the system continues to operate when a device becomes inoperable or a connection is impaired.	PR
6.1.2.2.4	Shall be available 24 hours per day, 7 days a week with an allowance for down time for maintenance.	PR
6.1.2.2.5	Shall be time-synchronized with an external time source at least once per day. List source origination, accuracy and update procedure. EA_MS shall provide central time management for the EnergyAxis AMI system by performing time synchronization of meters during each communications session if needed. EA-MS itself shall be time synchronized with either local LAN time sources or Internet available time sources.	FR
6.1.2.2.6	Components storing payload data shall utilize non-volatile memory for storing and retaining this information.	FR
6.1.2.2.7	Capable of connecting to a main voltage ranging from 120V to 240V with a range of from 100V to 277 VAC.	FR
6.1.2.2.8	Shall meet the following installation and operation requirements including: <u>EA Gatekeeper with Battery backup</u> • Packaged in a locking NEMA enclosure and has multiple mounting options: pole, building, or tower • Dimensions: 12 x 14 x 6 inches. (configurations with remote antennas are 14 x 16 x 6 inches) • Power – Less than 0.5 Amps at 120 VAC • Voltage Range – 96 - 264 VAC • Environmental –-40°C to +65°C, 0% to 100% non-condensing humidity <u>Tropos mesh routers</u> • Maximum weight of 16 lbs, • Maximum dimensions 13.0 in x 8.0 in x 5.3 in without mounting brackets or antennas	FR

	• input power consumption of 18W. • operating temperature range of -40°C to 55°C, • an IP67 weather rating, can survive winds in excess of 165 mph, • exhibit wind loading of <300 Newtons at 165 mph, • ASTM B117 salt fog rust resistance compliant • shock and vibration resistant per ETSI 300-19-2-4 spec T41.E class 4M3. • Mesh router shall be mounted at a height of 20 to 30 feet.	

FAN Controller/Collector – Functions

6.1.2.3 Supplier shall provide FAN Controller/Collector that meets the following requirements:

<table>
<tr><td>6.1.2.3.1</td><td>Shall support prioritized message processing as follows:
Ad-hoc Request Priorities
<table><tr><th>Task</th><th>Priority</th></tr><tr><td>Load Control Broadcasts</td><td>1</td></tr><tr><td>Power Status Check</td><td>2</td></tr><tr><td>Connect/Disconnect request</td><td>3</td></tr><tr><td>On Demand Read</td><td>4</td></tr><tr><td>IHD Messaging (unique message with guaranteed delivery to one device. Other IHD messages can be broadcast)</td><td>5</td></tr></table>
Load control broadcasts shall take priority over all other system functions and would interrupt LAN or WAN operations for up to 10 seconds, after which they would resume scheduled operations.
If there is an ongoing FAN Collector session, the system shall wait for the completion of that session prior to sending the next request.

Tropos GridCom network shall support traffic prioritization (QoS) in both the uplink and downlink.</td><td>FR</td></tr>
<tr><td>6.1.2.3.2</td><td>Shall support a secure, routable, utility extensible message format.</td><td>FR</td></tr>
</table>

6.1.2.3.3	Shall permit remote: 1. Status report (up/down) 2. Diagnostics 3. Link status report 4. Communications event log retrieval 5. Reporting of results of FAN connectivity and strength to the HES	FR

6.1.3 Head-End System

6.1.3.1 Head-End System – General

Supplier shall provide Head-End System that meets the following requirements:

6.1.3.1.1	Shall be capable of processing requests from the MDMS for 500 (or 1% of the AMI meter population) on-demand requests per day for refresh of meter interval data (not including the pre-scheduled meter data collection schedules).	PR
6.1.3.1.2	Shall be capable of performing data flow control after a communication or power outage to prevent resources from being overloaded.	FR
6.1.3.1.3	Shall be capable of supporting message priority for the following: 1) High priority – immediate need (e.g. on-demand meter read) 2) Medium priority – standard operational need (e.g. scheduled meter read) 3) Low priority – system information collection (e.g. error log collection)	

6.1.3.2 Head End System – Functions

Supplier shall provide Head-End System that meets the following requirements:

6.1.3.2.1	All messages received by the HES including all meter and non-meter reads shall be time stamped upon receipt by the HES.	FR
6.1.3.2.2	Validate the internal clock time for meters, distribution devices and all other field communications components at least once per day and synchronize with system time if the difference exceeds a configurable tolerance. Log reported resynch events.	FR
6.1.3.2.3	Log an event message for each meter if the daily time validation detects meter time that is greater than 120 seconds out of synch with system time source.	PR

6.1.4 AMI Solution Function

6.1.4.1 Field Tools and Meter Installation

Supplier shall provide Field Tools and Meter Installation that meet the following requirements:

6.1.4.1.1	Field tool(s) to be procured include five (5) sets of EA Inspector which can be used for both Energy Axis electric meters and water meters.	FR
6.1.4.1.2	Provide Meter Installation Services using Utility Partner of America (UPA) as a subcontractor as follows: Asset Management: UPA's inventory manager will receive inbound inventory. Any shortages or damages will be noted on the Bill of Lading "BOL" at the time of receipt. Once the product is received, the inventory manager will scan the barcodes positioned on the outside of the product cases using a Symbol or a Motorola hand-held computer. Inventory information collected in the hand-held computer will be downloaded to an inventory database. UPA's inventory manager will pick, stage and distribute inventory to the installation technicians daily in accordance with their assigned work orders. UPA's installation technicians will sign for the inventory they receive. At the end of their shift, the installation technicians will count uninstalled inventory with the inventory manager. Inventory retrieved from the field will be palletized or stored in large storage bins. The inventory recorded in the inventory database will be reconciled against the completed work order file on a periodic basis. Inventory will be physically counted monthly. Inventory reports will be made available on a periodic basis. Scheduling: UPA's data management department utilizes meter reading schedules and established meter reading routes to select and sequence areas of saturation. UPA's data management department utilizes intelligent routing software when established meter reading routes are not available. UPA will offer the route release schedule to the Utility so it can be used to schedule the distribution of the customer communication plan. Once the route release schedule is established; UPA's data management department will develop a complimentary production schedule that will be used to compare actual performance to planned performance.	FR

	Work Order Management System: UPA will utilize its Microsoft Windows based work order management system titled Data Acquisition System "DAS" to manage work orders. UPA utilizes rugged Motorola hand held technology to collect pertinent meter information, capture pre-installation and post-installation photographs and collect GPS coordinates. Hours of Operation: UPA plans to work between the hours of 8:00AM and 5:00PM Monday through Friday excluding the Utility's holidays. UPA requests the right to work non-traditional business hours and on Saturdays in order to accommodate customers who require an appointment and to compensate for unforeseen production delays. Meter Access Strategy: UPA will make as many as three physical attempts, three written attempts (if additional door hangers are provided by the Utility) and three phone call attempts in an effort to perform the installation or schedule an installation appointment. UPA will document the date stamp and the time stamp associated with each attempt. UPA will make attempts after traditional business hours and on Saturdays in an effort to make contact with the customer. If UPA is unable to gain access to the meter or schedule an installation appointment after it has completed the aforementioned process it will designate the work order as a Set-Aside account and will return the work order to the Utility for processing. UPA assumes that Set-Aside accounts will account for no more than 1.5% of the work order population. Customer Interaction: If UPA is able to make contact with the customer; UPA will greet the customer, announce their purpose, inform the customer that they will experience a brief interruption in service while the service work is performed and recommend that the customer turn off any electronic devices and/or appliances that may be impacted by a disruption in service. If the customer does not object and indicates that they have turned off their electronic devices and/or appliances UPA will assume it is free to proceed. If UPA is unable to make contact with the customer but it is able to gain access to the meter; UPA will assume it is free to proceed as long as it appears that the customer's service is not currently in use.	

	Call Center: UPA will designate a toll-free number to the AMI installation project. The toll free number will be published on all customer communication material. Customers who require an installation appointment can contact UPA's call center to schedule an installation appointment. UPA's call center is staffed with operators 24/7/365 and supports customers speaking as many as 150 languages and dialects. UPA's call center schedules installation appointments with a one-hour window of precision and will schedule a specific appointment if a specific appointment is necessary. UPA's call center provides courtesy calls 24 hours prior to scheduled.installation appointments to remind customers of their forthcoming appointments when time permits. UPA's call center will coordinate with the Utility's customer service departments. UPA's call center software allows UPA to administer soft handoffs both to and from the Utility's customer service departments. If a customer contacts UPA's call center regarding an issue unrelated to the AMI installation project; UPA's call center operator will transfer the call and remain on the line until a member of the Utility's customer service staff has accepted the call, is introduced to the customer and is made aware of the issue. Performance Reports: UPA utilizes its work order management system and its call center software to capture and store pertinent records. UPA's work order management system records the data stamps and time stamps associated with the opening and closing of each work order and UPA's call center records and stores all inbound and outbound telephone calls. UPA tracks a variety of performance metrics both in the field and in the office. UPA offers its customers a robust menu of standard performance and call center reports such as The Production Report, The Route Saturation Report, The Can't Complete Report, The Set-Aside Report, The Quality Audit Report, The Appointment Summary Report, The Field Incidents Report, The Customer Complaints/Claims Report, and the Call Center Performance Report. Claims Process: UPA has a formal customer claims process which is administered by UPA's call center. Customers who contact the call center with a complaint or a claim will receive a call from a member of the project management staff within one hour of notification. Emergencies are responded to within 15 minutes of notification. All claims are investigated within 72 hours and resolved within 14 days of notification. Resolutions are documented and will be made available to the Utility via The Customer Complaints/Claims Report.	

UPA's Process for Safely Replacing a Residential Single-Phase Self Contained Meters.:

1. The technician will safely park the work vehicle.
2. The technician will exit the work vehicle and approach the customer's door.
3. The technician will knock on the customer's door. If no answer the technician will proceed to step 5.
4. The technician will greet the customer, inform the customer who they are, who they represent and why they are there. The technician will inform the customer that the exchange procedure will only take a few minutes and will recommend that the customer turn off all electronics that may be interrupted while the service order is performed. The technician will wait for the customer's verbal response that they have turned off all electronics before proceeding.
5. The technician will verify the meter seal color and the work order information.
6. The technician will take a pre-installation photograph.
7. The technician will capture the required meter information.
8. The technician will enter comments if necessary.
9. The technician will put on all personal protective equipment (PPE).
10. The technician will examine the work environment for signs of danger, theft or irregularity. If danger, theft or irregularity is recognized the technician will contact a supervisor for direction.
11. The technician will remove the meter seal if applicable.
12. The technician will remove the meter door slowly.
13. The technician will examine the inside of the meter box for danger, theft or irregularity.
14. The technician will take a voltage reading, first reading across both phases and then each phase to ground individually.
15. If there is a bypass or a main breaker present at the meter the technician will operate the bypass or main breaker before removing the meter.
16. The technician will place both gloved hands on the meter. One hand will be placed on the bottom of the meter and will be used to steady the meter. The other hand will be placed on the top of the meter. The top hand will be used to unseat the meter by applying slow and steady downward force until the meter is released from the top meter jaws and rocks back into the bottom hand. The technician will then pull the meter away from the meter box removing it from the bottom meter jaws.
17. The technician will examine the inside of the meter can for danger or irregularity. The technician will examine wiring, connections, lugs, blade receivers and the meter block.

	18. If the meter can, block and contents appear to be in good condition, the technician will approach the meter can with the new meter. 19. The technician will place the meter in the front of the meter can slowly. The technician will look around the side of the meter in an effort to properly align the bottom two blades of the meter with the blade receivers. The technician will apply even pressure until the bottom two blades are inserted into the blade receivers. Once the bottom blades are in place the technician will apply even pressure both inward and upward until the two top blades are secure. 20. The technician will test the meter for operability. 21. If the meter is operable, the technician will install a new tamper seal using the proper utility selected color. 22. The technician will program the meter if applicable. 23. The technician will take a post-installation photograph if applicable. 24. The technician will remove PPE and survey the work area for any debris that may have been dropped during the procedure. 25. The technician will remove the old meter or meter material from the premise. 26. The technician will return to the work vehicle and prepare to repeat the process. UPA's process for safely installing other forms and classes of meters will be provided upon request. UPA's Process for Safely Replacing a Residential Water Meter or Water Meter Module. 1. The technician will safely park the work vehicle. 2. The technician will exit the work vehicle and approach the customer's door. 3. The technician will knock on the customer's door. If no answer the technician will proceed to step 5. 4. The technician will greet the customer, inform the customer who they are, who they represent and why they are there. The technician will inform the customer that the exchange procedure will only take a few minutes and will recommend that the customer turn off all appliances that may be interrupted while the service order is performed. The technician will wait for the customer's verbal response that they have turned off all appliances before proceeding. 5. The technician will open the meter pit. 6. The technician will remove excess pit debris and verify the meter number. 7. The technician will take a pre-installation photograph. 8. The technician will capture the required meter information.	

	9. The technician will enter comments if necessary. 10. The technician will put on all personal protective equipment (PPE). 11. The technician will examine the work environment for signs of danger, theft or abnormal conditions (e.g. leaks or corroded pipes). If danger, theft or abnormal conditions are recognized the technician will contact a supervisor for direction. 12. If changing a water meter module, the technician will complete the water meter module installation and proceed to step 20. 13. The technician will observe the meter register to determine if meter is clocking. 14. If meter is clocking and no one answered the customer door, the technician will can't complete the work order and notate the condition in the work order management system. 15. If the curb stop is found in the on position, the technician will turn the curb stop to the off position. 16. The technician will replace the existing meter and washers with the new meter and new washers and install the new water meter module. 17. The technician will turn the curb stop back to the on position. 18. The technician will examine the meter assembly for leaks. 19. The technician will proceed to the nearest spigot. 20. The technician will open the spigot and allow meter dial to run for one full revolution (10 gallons) to allow air and debris to clear out of water line. 21. The technician will program the meter if applicable. 22. The technician will take a post-installation photograph if applicable. 23. The technician will remove PPE and survey the work area for any debris that may have been dropped during the procedure. 24. The technician will remove the old meter or meter material from the premise. 25. The technician will return to the work vehicle Route Saturation: UPA understands that saturating routes is necessary to assure billing continuity, orderly management of meter reader daily activities during the deployment as well as orderly transition of meter readers to other positions. UPA will not perform meter installations during the blackout period.	

UPA's data management team will open a limited number of routes in order to provide the project management team with a sufficient number of work orders. New routes will not be released until open routes are substantially saturated. UPA tracks route saturation daily and offers The Route Saturation Report as part of its standard menu of performance reports.

Meter Installation Data Recovery:

UPA will produce an electronic data record using its work order management system with each meter installation attempt, whether failed or successful. The data provided from successful installations will include but not be limited to:

- The installation status
- Existing meter number
- The register value of the existing meter
- The new meter number
- The meter seal number of the new seal
- Tamper status
- Date and time of installation

UPA will use its work order management system to record and transfer records of safety incidents, infrastructure conditions and customer incidents to the Utility. Any customer incident resulting in a customer complaint or a customer claim will also be reported to the Utility via The Customer Claims Report.

Ancillary Data Collection:

UPA will provide the following ancillary data:

- A picture of the existing installed meter along with a picture of the new installed meter/module.
- GPS coordinates of each electric and water meter.

The price associated with the pre-installation and post installation photograph and the GPS coordinate collection is inclusive of UPA's installation prices.

	Quality Assurance: UPA will quality audit 100% of the exchange or retrofit work performed by employees during the first ten days of work and 5% thereafter. If an employee produces an error rate of equal to or greater than 1%, the employee will be retrained. If an employee produces an error rate of equal to or greater than 1% after being retrained, the employee will be dismissed. UPA will quality audit 100% of all photographs taken in the field in an effort to verify the reading captured by UPA's installation technicians for no less than the first three months of the AMI installation project. After three months, UPA will quality audit photographs taken in the field on an as needed basis. Utility Partners of America (UPA) guarantees an error rate of less than 1% and warrants that all work related to the installation of meter products substantially conforms to the manufacturer's recommendations for installation and follows industry standards and quality guidelines. For a period of two (2) year from the date of substantial completion of the installation; UPA will repair or re-install the meter products or modules, in the event the installation is shown to have been inconsistent with industry standards. UPA will provide The Quality Audit Report to the Utility weekly. The Quality Audit Report will display the number of meters and that were inspected within each route and the results of the inspections. Disposal Services: UPA will dispose of new meter packaging and old meters properly and responsibly. SVP will review and approve UPA's disposal process and procedures. UPA will implement adjustments to meter disposal process as requested by SVP and mutually agreed to by UPA.	
6.1.4.1.3	All meters to be tested and traceable to NIST standards for accuracy specification. All supplier based Alpha based meters (A3 meter Gatekeeper and A3 meter with EA_NIC) shall be calibrated to +/-0.2% accuracy. REX2 meters with EA_NIC are calibrated to +/-0.5% accuracy. Elster's test stations shalle utilize calibration and test equipment from Watthour Engineering Company (WECO). Each station shall contain 1 or 3 Radian Research watthour standards which are the basis for the meter's calibration. Single phase calibration stations shall contain 1 standard, and polyphase stations contain 3 standards.	FR

Each calibration station's Radian standards shall be checked every 5 days, using a portable Calibration Cart which contains 3 Radian watthour standards. These calibration checks shall be logged into the manufacturing database. When a Meter is to be calibrated on the station, the manufacturing software shall check the database to see that the station has been checked within the last 5 days. If the 5-day check has not been performed, the station shall be automatically locked out until the station check is done.

The 3 Radian standards in the Calibration Cart shall be sent back to their manufacturer, Radian Research Incorporated, once a year to be re-calibrated on the manufacturer's equipment, which in turn shall be traceable to NIST. For each calibration, Radian Research shall issue a calibration report, which shows the date of calibration, the next due date, and the amount of error at each test point. This report also certifies that the equipment used to calibrate the standard shall be traceable to NIST.

Supplier shall execute the following calibration methodology:

1	Meter barcode scanned retrieve meter's test parameters and configuration from master database.
2	Power up meter check
3	Check for presence of voltage link, as applicable.
4	Install battery, if required.
5	Download test data set into meter.
6	Load applicable DSP code & data into meter.
7	Test any installed communications option (RS232, RS485, etc), if applicable
8	Push-button test (Reset, ATL Mode, and Test). Verify the effect of each in the meter.
9	Battery check, if applicable.
10	Test relays, if applicable
11	Record initial as-found calibration readings with reference to Radian watthour standard.
12	Adjust meter calibration via optical port.

	13	Take final as-left calibration readings with reference to Radian watthour standard.	
	14	Download customer program into meter, if required.	
	15	Check meter's self-test status and operation.	
	16	If meter passed all tests, post its data to archive database and identify it as passed and calibrated. If it failed, post data in failure database and reject meter.	
6.1.4.1.4	Meter shall be preprogrammed with default SVP configuration prior to shipment from the manufacturer.		FR
6.1.4.1.5	Meter shall be physically assigned a utility meter number (before it arrives at utility) which identifies manufacturer, meter form, voltage, communications type, etc.		FR
6.1.4.1.6	Individual meters shall be identifiable within shipping containers and packaging (can be RFID - Radio Frequency ID tag or bar code). Meter identification mechanism shall require minimal manual interaction, and should be usable by various users (warehouse tech, meter shop tech, meter installer).		FR
6.1.4.1.7	Meter packing labels shall include class, voltage, wire, cycles, test amps, KW, catalog number, Purchase Order number and release, quantity, meter form, born-on date, lot number, utility meter numbers in box, manufacturer serial number.		FR
6.1.4.1.8	Upon completion of proper authorization by the meter of a Field Tool, meter shall be able to identify itself to Field Tool and provide access to its data and configuration settings at installation time, and later in support of ongoing operations & maintenance activities. The Field Tool is used for diagnostic, troubleshooting, and providing additional insights into the LAN network operation and performance.		FR
6.1.4.1.9	Meter shall communicate locally to a Field Tool independently of the normal AMI communications mechanism.		FR
6.1.4.1.10	Meter shall support local download to the EA InspectorField Tool of all meter and communications data and logs stored in meter memory through both wireless and optical port communications. The EA_Inspector Field Tool shall communicate with the AMI meters via wireless radio frequency. Communication with the meters via the optical port shall also be available using Supplier provided Metercat software that can be installed on standard laptop computer.		FR
6.1.4.1.11	Meter shall support local download to a Field Tool of all meter and communications data and logs stored in meter memory within one (1) minute or less.		PR

6.1.4.1.12	Field Tool shall check security/authentication for local meter data download attempts to ensure downloads can only be executed by authorized utility or third party personnel. Includes secure local download of all meter and communications data and logs stored in meter memory (e.g. register read, demand, interval data, logs, voltage, PF, etc.).	FR
6.1.4.1.13	This requirement is deleted.	FR
6.1.4.1.14	Meters and distribution devices shall log source of request for data download attempts from both Field Tool and FAN Controller/Collector. If the number of invalid communication attempts exceeds a user-defined threshold, the meter sets an invalid access warning flag. In addition to ensuring that the meter data is protected and that programming cannot be altered without proper authorization, the encryption key is used to encrypt data transmitted over the radio link.	FR
6.1.4.1.15	Installation Field Tool shall provide work order functionality to allow for investigation, resolution, and initiation (for as-found problems identified in field) of trouble reports.	FR
6.1.4.1.16	Field Tool shall test the AMI communications interface on the meter. The EA_Inspector field tool can be used to validate RF communication by "pinging" a specific AMI meter to find all registered devices within its range.	FR
6.1.4.1.17	This requirement is deleted.	FR
6.1.4.1.18	The EA_Inspector shall be a multi-function field tool. The field tool shall support the following functions: • Locating registered nodes • Identifying unregistered nodes • Pinging specific node • Controlling service disconnect switch • Controlling the broadcast for 900 MHz in-home display.	FR
6.1.4.1.19	This requirement is deleted.	FR
6.1.4.1.20	This requirement is deleted.	FR
6.1.4.1.21	As meters self-register, the the EA_MS places the meter into an installed group. The meter shall then be added to the appropriate read schedule after the installation order is completed, through EA_MS.	FR
6.1.4.1.22	This requirement is deleted.	FR

6.1.4.1.23	EA_Inspector Field Tool shall be capable of data collection and RF communication diagnostic from supplied Elster meters and other supported AMI devices. The Field Tool shall wirelessly communicates to AMI devices collecting register data for verification. Metercat software, installed on a standard laptop computer, shall be able to access and retrieve locally meter configuration information (i.e. channel multipliers, meter multipliers, unit of measure per channel, other basic meter info, etc.).	FR
6.1.4.1.24	This requirement is deleted.	FR
6.1.4.1.25	UPA's Field Tool shall accept old meter ID. UPA shall utilize its Microsoft Windows based work order management system titled Data Acquisition System "DAS" to manage work orders. UPA shall utilize rugged hand-held technology to collect pertinent meter information, capture pre-installation and post-installation photographs and collect GPS coordinates. UPA shall synchronize its hand held technology daily, quality audit the data it collected in the field and investigate data exceptions prior to returning completed work order files to the utility. UPA will return completed work order files to the utility daily.	FR
6.1.4.1.26	UPA's Field Tool shall accept old meter final reading. UPA shall utilize its Microsoft Windows based work order management system titled Data Acquisition System "DAS" to manage work orders. UPA shall utilize rugged hand-held technology to collect pertinent meter information, capture pre-installation and post-installation photographs and collect GPS coordinates. UPA shall synchronize its hand held technology daily, quality audit the data it collected in the field and investigate data exceptions prior to returning completed work order files to the utility. UPA shall return completed work order files to the utility daily.	FR
6.1.4.1.27	By default, meter disconnect switch shall be in the "closed"/connected position upon installation.	FR
6.1.4.1.28	Upon installation, the meter shall recognize it is in the wrong socket (configuration, i.e. number of clips) and alarm this condition. The REX2 meter when installed in the correct socket type, shall energize and begin its registration. If the meter is installed such that the reversed energy is flowing, the meter shall alarm this condition. The A3 meter shall support service voltage test for detecting the proper wiring condition. When incorrect wiring condition is detected, the A3 meter shall alarm this condition.	FR

6.1.4.1.29	Upon installation, meter shall self-register on the HES via the Field Area Network (FAN). Self-registration data shall include: 1. New meter ID 2. New meter installation read 3. Communications address 4. Meter log information 5. Removed meter ID 6. Removed meter read 7. Security credentials 8. Customer devices present within HAN (may not use this information until customer enrolls) 9. Current program identification	FR
6.1.4.1.30	If not self-registered on install, meter shall self-register on the HES the first time that communication is established. Pre-condition: meter must be supplied a unique identifier before the meter can authenticate.	FR
6.1.4.1.31	In the case of self-registration failure, meter shall be able to automatically reattempt self-registration after a configurable period of time.	FR
6.1.4.1.32	Upon installation, meter shall perform a self diagnostic and detect and log all failures. SVP defined critical failures shall be reported to the HES immediately (including, at a minimum, check sum error, meter failure from firmware upgrade, metrology failure, program or memory failure, and time synch failure).	FR
6.1.4.1.33	Upon installation, meter shall be able to communicate the following to Field Tool: 1. Meter health check/diagnostic results 2. Communications network check results	FR
6.1.4.1.34	Meter shall complete installation self-registration and self-diagnostic processes in less than two minutes combined. This is driven by the fact that total meter installation time shall be less than 15 minutes.	PR

6.1.4.2 Meter Integration/Network Management

Supplier shall provide Meter Integration/Network Management that meet the following requirements:

6.1.4.2.1	Describe network management system and operation for all managed devices in the network including device management, device status and event notification.	FR

6.1.4.2.2	The AMI system shall provide a network management system operator interfaces and displays that meets the following requirements: The EnergyAxis Management System (EA_MS) shall manage and monitor the utility's Smart Grid communications and network elements and devices used for data acquisition for AMI, Distribution Automation (DA) and Demand Response (DR) applications. It shall be designed to scale to meet the utility's growing needs and shall provide network monitoring, control, and reporting capabilities. The EA_MS shall use industry standard protocols facilitating interoperability and business intelligence with the utility's IT infrastructure. The EA_MS shall be based on the ITU-T TMN Model with five layers of management as follows: 1. Network Element Management – Unites and concentrates distributed devices (AMI, DA and HAN) to be managed in a unified way using one management system. The EnergyAxis gatekeepers shall have distributed intelligence and create and manage sub-networks of devices. 2. Element Management – Provides continuous discovery for OSI Layers 2 and 3, device monitoring and management, network health monitoring, version control, remote firmware upgrades, device interoperability, integrated installation, configuration and provisioning to allow seamless management of network elements. 3. Network Management – Enables the activities, procedures, and tools to monitor the network, perform corrective actions, and assign and upgrade resources. Assignment of resources shall include the ability of the EA_MS to reserve some communication resources for high priority messaging such as inbound outage notifications while allowing other communication ports to be dynamically assigned for schedule reads based on changing data requirements. 4. Service Management – Provides timely and accurate reporting of network element device data including status, events and alarms such as for outage detection. Enables the management of data collection for billing data, time-of-use, voltage monitoring, PQM and more. It shall provide management for connect/disconnect, load control, distribution automation, in-home control and messaging. 5. Business Management – The EA_MS shall provide industry standard SOA API interfaces to the utility's business systems.	FR

	Within the overall structure of the utility, the EA_MS shall reside behind the corporate firewall and shall be connected to the enterprise bus. This shall allow the data from the EA_MS to flow to other enterprise applications as needed. The EA_MS users shall be able to access the system remotely with standard Internet browsers such as Microsoft Internet Explorer 6.0 using an Intranet, Extranet, Internet, or remote LAN connections. If a corporate Internet web gateway exists, the Web interface shall be able to be linked to it, providing worldwide web access for all of the EA_MS functions. HTML and Adobe Flex allow the operator applications to be platform independent. The EA_MS security features shall allow only authorized users to access to the system. Role-based access shall be assigned by the System Administrator to restrict access for specific functions. For example, a CIS operator user shall be authorized to view meter data or to request a meter reading, but can be restricted from changing any meter parameters. The dashboard shall be central to managing the network. It shall provide the utility immediate access to vital network operations information and is designed for ease of use with drill-down links and fly-over pop-ups that allows the user to view source data. The dashboard shall be flexible to meet the needs of the utility and shall be configurable per role-based user groups. Users with different permissions shall have access to different screens and functionality. In addition, each user shall be able to modify the windows on the dashboard to accommodate their job requirements and preferences. Within the EA_MS dashboard there shall be pods. Each pod shall serve a specific purpose and contains information related to a single area of system operation. Current pods shall include: Schedule Metrics, System LAN Metrics, WAN Metrics, and GIS Mapping. The system shall accommodate additional Pods addressing different network characteristics that are planned in future system releases. **Schedule Metrics** – Schedules in EnergyAxis define what data needs to be collected, from what devices and how frequently. Most utilities have several schedules. The EA_MS shall monitor all schedules and allows the user to find information about active, inactive and terminated schedules. **System LAN Metrics** – The System LAN metrics pod shall provide summary level information on the system-wide performance of the EnergyAxis mesh network. In this view, the user shall be able to view a summary of the total number of devices throughout the system summarized by hop level. **WAN Metrics** – The WAN metrics pod and the associated detail view shall provide the utility with all of the information needed to efficiently manage the wide area network communications of the EnergyAxis system.	

	GIS Mapping Metrics – The GIS Mapping pod shall provide network system operators important network management details shown geo-spatially. The geographic view helps manage and troubleshoot the wireless mesh network. It shall show outage, restorations and other events as they occur. The Tropos GridCom network proposed for the backbone/WAN shall include a comprehensive and scalable management system platform, Tropos Control. Tropos Control shall provide a web-based interface that: • Supplies a high-level view of every aspect of network performance and highlights potential areas for optimization • Automatically tracks key network, mesh, and backhaul performance thresholds to provide managers with clear notification of optimization opportunities • Offers access to detailed per-router performance data • Provides granular detail on client link and connection history, providing current and historical context for performance optimization • Provides insight into performance levels from client devices • Fully integrated with Google Maps to support creation of network maps with multiple zoom levels and terrain views. • Provides status updates, layout, mesh links, and performance data can all be accessed directly from the map • Offers a complete, unified network view to provide visibility into an entire network of interdependent mesh routers • Provides comprehensive alarm and event monitoring tools and root cause diagnostics Provides performance measurement tools to track network usage, overall capacity, and the correlated impact on client, mesh and backhaul performance	
6.1.4.2.3	Network shall provide a secure pairing process for new devices connecting to network. A "marriage" file shall be created during the manufacturing process that shall bond the meter serial number with the MeterID (Utilty ID plus LAN ID). This file shall then be imported into EA_MS and deployed meters are managed using this file.	FR

	An unknown device unless provisioned through a marriage file or manual entry shall not pose a security threat. Devices not provisioned appropriately shall not register or have access to the network. Any devices installed in the system without appropriate provisioning shall appear in a separate report in the EA_MS. The Tropos GridCom communications system used in the backbone/WAN shall provide guest access though the configuration of one or more guest VLANs.	
6.1.4.2.4	This requirement is deleted. It is a duplicate of 6.1.4.2.3 above.	FR
6.1.4.2.5	The EA_MS shall provide extensive reporting to assist in system operation and maintenance reports at least once a day, as well as on-demand that contain key diagnostics and statistics from all AMI meters, devices, and field communication network elements. These reports shall include the following: • Network management pods – Please refer to the response to question 6.1.4.2.2 for description of each pod. • System dashboard – provides a log of each user's activities as well as key alarms and statuses. • System operation reports – provide information on meter types and configurations, TOU schedules, data sets, association between meters and gatekeepers, meter's LAN performance statistics, etc. • Schedule operation reports – provide information on schedule execution list, performance statistics, retries, etc. • Home Area Network reports – provide information on HAN listings, HAN configurations, device commissioning statuses, event listings, messaging, etc.	FR
6.1.4.2.6	HES should be modular to permit change of network communications technology.	FR

<table>
<tr>
<td>6.1.4.2.7</td>
<td>A gatekeeper shall typically support approximately 750 (620 single-phase and 130 polyphase) electric and 350 water meters. Individual gatekeeper shall support more or less than this estimate due to physical location and meter density. The ratio of meter to gatekeeper shall be easily improved by deploying additional gatekeeper where needed.

The projected amount of estimated data that may be provided is listed below on a per gatekeeper basis.
<table>
<tr><th>Type of Data</th><th>Bytes per gatekeeper</th></tr>
<tr><td>Register data (electric + water)</td><td>145,703</td></tr>
<tr><td>LP data - single-phase meter (1 channels 15-min)</td><td>159,712</td></tr>
<tr><td>LP data - polyphase meter (2 channels 15-min)</td><td>67,102</td></tr>
<tr><td>LP data - water (1 channel 60-min)</td><td>12,212</td></tr>
<tr><td>Total Daily</td><td>384,729</td></tr>
<tr><td>Total Monthly</td><td>11,541,871</td></tr>
<tr><td>Total Annually</td><td>138,502,454</td></tr>
</table>
</td>
<td>FR</td>
</tr>
<tr>
<td>6.1.4.2.8</td>
<td>Responder shall implements methods used to ensure accuracy of transmitted meter readings including data integrity and security. These methods are described as follows:

The EnergyAxis 900 MHz local area network (LAN) uses a frequency hopping spread spectrum (FHSS) radio. FHSS systems are typically used in unlicensed frequency bands where multiple radio systems may co-exist. FHSS systems are also used in critical applications where security is vital (such as military communications) because they enhance the security of radio transmissions. The inherent enhancement of security in FHSS systems is due to the pseudo-random nature of the radio communications. The EnergyAxis System transmits each packet of data on one of 25 available channels. The next data packet is transmitted on another channel in a pseudo-random channel selection process that provides immunity to eavesdropping and interception.</td>
<td>FR</td>
</tr>
</table>

	In addition to the security provided by the FHSS radio in the end devices, additional security is provided through the use of 128-bit AES encryption utilizing unique keys for each end device. As part of the EnergyAxis System, the devices can be configured to only respond to data requests (reads or writes) if the command is properly encrypted. If the request is not properly encrypted, the meter will not acknowledge the request as valid (NAK). The meter will not comply with the request and the NAK is identified as an invalid radio access attempt. This combination of an FHSS system and 128-bit AES encryption prevents direct tampering. EnergyAxis System shall provide an easily manageable key infrastructure to allow SVP to manage the security key updates as needed, providing unique keys for every device across the LAN and reducing the complexity of key management. Without the possibility of direct tampering, an adversary may attempt indirect methods of tampering such as packet replay attacks. In a packet replay attack, an adversary stores a radio transmission and replays the transmission at a later time. For example, an adversary might attempt to store load control or pricing commands to replay at a later time. EnergyAxis devices shall have anti-replay mechanisms that use date/time stamps in each radio transmission to prevent messages from being stored and replayed at a later time. In addition to the security techniques to prevent unauthorized access, EnergyAxis devices have status information to identify attempts to breach the device (meter, AGInode, etc). The security status information shall include: • Count of the number of invalid optical port access attempts (access attempts with an invalid password) • Count of the number of invalid radio access attempts (access attempts with an invalid encryption key) • Access warning status flag if either the optical port or radio invalid access attempt counts exceed a configurable threshold. The meter can be configured to immediately transmit an exception message when this status flag is set. • A status flag to indicate a table write. The meter can be configured to immediately transmit an exception message when this status flag is set. • The date and time of the last table write. • A tilt warning if the meter is removed from the installation site.	

	In extremely sensitive security situations, the devices shall be capable of being put in a locked mode, where writes to any configuration table are electronically denied. When in the locked mode, EnergyAxis devices can only be unlocked if the device seal is broken (i.e. the physical packaging such as the meter cover is removed) and an Elster specific hardware/software technique is used to unlock the device. The Tropos GridCom communications system used for the backbone/WAN shall facilitate secure transmission between meters and the AMI HES. The Tropos GridCom system shall provide security in five areas: 1. Network access control 2. Protection of shared assets from malicious wireless users 3. Protection of wireless clients from malicious wireless users 4. Secure end-to-end data traffic transmission 5. Secure network configuration, operation and management Tropos shall implements only security algorithms that have been industry-proven and verified and that have been shown to be appropriate for wireless IP broadband mesh networks. The techniques, protocols and algorithms that shall be used by Tropos, such as traffic filtering, WPA2, EAP, RADIUS, AES, HTTPS, and VPNs, shall have been employed for many years in a wide variety of Internet applications.	

6.1.4.3 Scheduled Reads

Supplier shall provide Scheduled Reads that meet the following requirements:

6.1.4.3.1	Solution shall support meter read schedules from MDMS including download of default meter schedule into meters and processing of meter reads by MDMS using scheduled polling.	FR
6.1.4.3.2	Meter read time shall be remotely set and meter shall store its own default read schedule. The EnergyAxis system shall implement a distributed intelligence system design in which meter read schedules are a system wide action. The meters shall continually measure and store energy and demand consumption. The Gatekeeper shall upload the meter's register reading (energy, demand, TOU, etc.) every four hours by default and the load profile data every 6 hours by default. Both of these values shall be changeable as per SVP's requirements. The EA_MS shall upload the meter data from each Gatekeeper at least once a day as defined by the read schedules.	FR
6.1.4.3.3	Receive and log the meter acknowledgement of successful default read schedule setup.	FR

6.1.4.3.4	HES shall support scheduled meter reads and provide performance metrics including the number of "meters not read".	PR
6.1.4.3.5	HES shall provide event notification when receipt of acknowledgement of a MDMS polled read request from meter takes longer than one (1) minute. The EA_MS shall provide the status of the user's or system's activities. When an activity takes longer than the SVP configureable maximum number of retries or the configurable read window, the activity shall be terminated and its status reported as failed.	PR
6.1.4.3.6	Meter shall send all read meter data according to its stored default read schedule (without being prompted by any external command or communication).	FR
6.1.4.3.7	HES will perform load balancing on the communications network resulting from scheduled meter reads, support meter read retries when communications fail, and provide clients with meter diagnostic information.	FR

6.1.4.4 On Demand Reads

Supplier shall provide On Demand Reads that meet the following requirements:

6.1.4.4.1	HES shall support a web service interface that specifically allows external systems to issue requests for On Demand Reads. Use of this interface requires that the interfacing system (MDM or other) develop the logical connector/adapter to issue the correct calls and work flow to the HES to accomplish the desired objective. Elster's web service interfaces are published to allow enterprise providers to execute the necessary integration effort. Elster also provides basic support on the proper use of the web service interfaces. This basic support is limited to the logical interface itself. Consultation on business work flow and scoping of the overall integration effort is also available but has not been included in the existing Elster offering.	FR
6.1.4.4.2	Process response to requests for on-demand access to meter and log data.	FR
6.1.4.4.3	Optimize group on demand reads to minimize the impact on system performance. EnergyAxis shall be designed to manage network traffic and optimize system performance through a fixed hierarchy of message handling. Ad-hoc requests such as on-demand reads, connect/disconnect requests, power status checks and load control broadcasts shall have a higher priority at the head-end than scheduled collection reads in the utilization of available communication lines/communication sessions. For an ongoing Gatekeeper session, the system shall wait for the completion of that session prior to sending the next request.	FR
6.1.4.4.4	Retrieve logs on demand from meters and distribution devices and all FAN Controller/Collectors.	FR

6.1.4.4.5	EA_MS shall provide an acknowledgement message on the success status of an on-request command.	FR
6.1.4.4.6	Record the source, type, and ID of all distribution system device data.	FR
6.1.4.4.7	Identify distribution system devices that did not send requested data.	FR
6.1.4.4.8	Prioritize scheduled and unscheduled read data for recipients with time sensitive data requirements.	FR

6.1.4.5 Event Message/Management

Supplier shall provide Event Message/Management that meet the following requirements:

6.1.4.5.1	Meter shall receive, send, store, log, and process many types of event and informational messages including disconnect, reconnect, prepayment, meter read schedule, maintenance, demand response curtailment start/end, customer override, etc.	FR
6.1.4.5.2	Meter shall authenticate message/request sources (systems or devices) prior to processing or displaying such information.	FR
6.1.4.5.3	Meter shall reject and log messages/requests that are received from unauthorized systems or devices.	FR
6.1.4.5.4	This requirement is deleted. Refer to 6.1.2.3.1	FR
6.1.4.5.5	Meter shall send an acknowledgement of receipt of event and informational messages to the HES.	FR
6.1.4.5.6	HES shall support reporting of network events from the gatekeepers within a configurable length of time. Additionally, HES shall provide acknowledgement of control messages and return code associated with an operation within seconds depending on the AMI network topology and communication path depth.	PR
6.1.4.5.7	Meter shall log all messages sent to and received from the HES. Meter message logs shall include the following information at a minimum: message type, process status, system/device source, date/time received or sent (internal meter clock), event schedule (start and end) date/time (if applicable), hourly and/or time-of-use (TOU) price information (if applicable for the event type).	FR
6.1.4.5.8	HES shall send and receive various types of event messages (e.g. demand response, load control, disconnect/reconnect, prepayment, etc.) to and from all solution components (e.g. meters, distribution devices and FAN Controller/Collectors).	FR
6.1.4.5.9	HES shall allow scheduling of conflicting events by processing higher priority messages first.	FR
6.1.4.5.10	HES shall schedule event messages to be delivered to the meter, display device or control equipment to ensure the utility meets regulatory requirements (e.g. day ahead event by 3:00 p.m. of the previous day, day of event by 10 a.m. of day and real-time events on-demand).	FR

6.1.4.5.11	All event messages sent by the HES shall be acknowledged by the targeted device (FAN, meters, etc.). For synchronous requests, the target component will respond with the result of the request. For asynchronous requests, the target component will acknowledge receipt of request and will asynchronously notify HES of results.	FR
6.1.4.5.12	HES shall log all messages (event and informational) sent to and received from all solution components (meters, communications devices, etc.) with the message date/time, event/message type identifier, and source/target(s) identifier.	FR
6.1.4.5.13	In the event that an event message is not acknowledged (if expected), HES shall be able to automatically retry the operation. This frequency and timing of this functionality shall be configurable, dependent on the event message type and device target.	FR
6.1.4.5.14	HES shall provide a mechanism used to perform bulk operations with respect to connects, disconnects, and demand resets on a list (group) of network devices to minimize impacts. The HES shall support Smart Energy Profile (SEP) 1.0 functionality to broadcast messages to HAN devices based on rate class, geography, etc.	FR

6.1.4.6 Local Display Configuration

Supplier shall provide Local Display Configuration that meet the following requirements:

6.1.4.6.1	HES shall communicate alpha/numeric informational messages to the meter and/or other customer display devices.	FR
6.1.4.6.2	Remotely configurable to record the amount of gross and/or net energy consumed and generated (kWh) within the current bill cycle so that it can be displayed on a premises device and/or meter display.	FR

6.1.4.7 Testing and Diagnostics

Supplier shall provide Testing and Diagnostics that meet the following requirements:

6.1.4.7.1	Shall provide the capability to verify operational status of each electric elements based on periodic schedule or on-demand request.	FR
6.1.4.7.2	Remotely detect network communications problems including loss of redundant communications pathways, diminishing signal strength, repeated delays in acknowledgement, etc.	FR
6.1.4.7.3	Log the results of all remote testing and diagnostics activities and any automatic actions taken based on those results.	FR
6.1.4.7.4	Make the results of all received alerts and remote testing and diagnostic results available to the MDMS.	FR

6.1.4.7.5	Have configurable alert levels and notifications based on the severity of a problem detected and the number of endpoints affected.	FR
6.1.4.7.6	EA_MS shall collect extensive network performance statistics or diagnostics and makes the information available through reporting. The schedule for statistics collection shall be user configurable (i.e. be collected with the daily schedule reading).	FR
6.1.4.7.7	The meter self test shall be performed automatically under the below conditions. • after any power restoration • at midnight • immediately after a data–altering communication session The gatekeepers and AMI endpoints shall periodically perform a self test to determine if it is operating properly. The self test shall ensure that the meter is functioning properly and its displayed quantities are accurate. Any errors encountered shall be displayed on the LCD. The meter shall be configureable such that customer selected errors initiate an outbound alarm notification to the EA_MS.	FR
6.1.4.7.8	Support a remotely or locally initiated meter test for communications connection status.	FR
6.1.4.7.9	Support a remotely or locally initiated meter test for energized status.	FR
6.1.4.7.10	Support a remotely or locally initiated meter test for load side voltage.	FR
6.1.4.7.11	Support a remotely or locally initiated meter test for disconnect switch status.	FR
6.1.4.7.12	Support a remotely or locally initiated meter test for internal clock time accuracy.	FR
6.1.4.7.13	Initiate meter tests automatically based on a schedule stored within the meter, based on a schedule stored within the FAN Controller/Collector, or based upon the detection of certain events by the meter.	FR
6.1.4.7.14	Send non-energy usage messages and alarms to the HES that contain date/time from internal meter clock, message code/type, and meter identifier.	FR
6.1.4.7.15	Diagnose self-test results and determine if failures are critical or non-critical in order to assess what kind of notification should be provided (e.g. immediate, nightly, only upon request, etc.). Prioritize failures by safety/service versus other failure types.	FR
6.1.4.7.16	Test/check that meter is recording data correctly and consistently. Detect, log, and report program or memory failure. Detected failures shall be logged and generate an event report to the HES.	FR
6.1.4.7.17	Perform self check at least once per month and as often as once per day and results logged and reported in with next scheduled read.	PR
6.1.4.7.18	Send safety/service failure events within five (5) minutes of detection.	PR

6.1.4.7.19	Meter shall make diagnostic log information available either on-demand or upon next default scheduled meter read to HES via FAN.	FR

6.1.4.8 Software/Firmware Upgrades

Supplier shall provide Testing and Diagnostics that meet the following requirements:

6.1.4.8.1	Accept and install software/firmware upgrades provided from HES.	FR
6.1.4.8.2	Accept and install software/firmware upgrades provided locally from Field Tool.	FR
6.1.4.8.3	Continue normal operation while downloading software/firmware upgrades until instructed to change to the new version.	FR
6.1.4.8.4	Permit remotely or locally initiated reversion of software/firmware to a previous version.	FR
6.1.4.8.5	Automatically revert to a previous version of software/firmware if a critical failure is detected on start-up following upgrade; reversion shall not happen repeatedly.	FR
6.1.4.8.6	Current meter software/firmware version shall be remotely and locally readable.	FR
6.1.4.8.7	Configurable to retain stored register reads over a software/firmware upgrade.	FR
6.1.4.8.8	Configurable to reset stored register reads over a software/firmware upgrade.	FR
6.1.4.8.9	Retain all meter configuration settings, status, customer information, and event logs over a software/firmware upgrade.	FR
6.1.4.8.10	Designed with failsafe logic to avoid misoperation of the disconnect switch and load control/distributed generation during software/firmware upgrades. Firmware upgrade shall not cause remote connect/disconnect to operate or change current state.	FR
6.1.4.8.11	Log firmware download and upgrade attempts, failures, successes, reversions, etc. with timestamp.	FR
6.1.4.8.12	Coordinate software/firmware upgrade scheduling, including identifying which meters need to be upgraded.	FR
6.1.4.8.13	Compare pre-software/firmware upgrade meter data, meter status and connect/disconnect position pre-upgrade status with post-upgrade status to ensure that upgrades are successful.	FR

6.1.4.9 Remote Connect/Disconnect

Supplier shall provide Remote Connect/Disconnect that meet the following requirements:

6.1.4.9.1	Meter is to remain energized and continue to monitor and record consumption (i.e. zero consumption for each interval) when disconnect switch is in the open/disconnected position.	FR

6.1.4.9.2	HES shall support a web service interface that specifically allows external systems to issue requests for scheduled connect/disconnect. Use of this interface requires that the interfacing system (MDM or other) develop the logical connector/adapter to issue the correct calls and work flow to the HES to accomplish the desired objective. Elster's web service interfaces are published to allow enterprise providers to execute the necessary integration effort. Elster also provides basic support on the proper use of the web service interfaces. This basic support is limited to the logical interface itself. Consultation on business work flow and scoping of the overall integration effort is also available but has not been included in the existing Elster offering.	FR
6.1.4.9.3	HES shall support a web service interface that specifically allows external systems to issue requests for on demand execution of connect/disconnect. Use of this interface requires that the interfacing system (MDM or other) develop the logical connector/adapter to issue the correct calls and work flow to the HES to accomplish the desired objective. Elster's web service interfaces are published to allow enterprise providers to execute the necessary integration effort. Elster also provides basic support on the proper use of the web service interfaces. This basic support is limited to the logical interface itself. Consultation on business work flow and scoping of the overall integration effort is also available but has not been included in the existing Elster offering.	FR
6.1.4.9.4	This requirement is deleted.	FR
6.1.4.9.5	Detect duplicate service disconnect/reconnect events and ignore the duplicate events (e.g. meter is already on -- reconnect event accepted with no action taken).	FR
6.1.4.9.6	This requirement is deleted.	FR
6.1.4.9.7	Send a meter read and acknowledgement to HES upon a successfully completed or failed electric service disconnect/ reconnect event.	FR
6.1.4.9.8	Enable an SVP employee working on-site at the customer premises to be able to physically operate its service disconnect/reconnect switch at any time (24x7x365).	FR
6.1.4.9.9	Support an external authorization/authentication routine (i.e. by remote systems or field tool) to enable only active and eligible SVP employees to operate its service disconnect/reconnect switch on-site at the customer premises.	FR
6.1.4.9.10	This requirement is deleted.	FR
6.1.4.9.11	Enable remote disconnect/reconnect/limiting events to be sent and executed on demand.	FR
6.1.4.9.12	This requirement is deleted.	FR

6.1.4.9.13	Support sending notification messages to an in-home/business device informing customer of impending/scheduled disconnect or service limiting event (including date and time of scheduled event).	FR
6.1.4.9.14	This requirement is deleted. Refer to 6.1.2.3.1	FR

6.1.4.10 Sub-metering

Supplier shall provide Sub-metering that meet the following requirements:

6.1.4.10.1	HES shall be capable of supporting Sub-Metering for up to ten (10) Sub-Meters via grouping of meter reads. The group of sub-meters can be assigned to a same read schedule.	FR

6.1.4.11 Distributed Generation

Supplier shall provide Distributed Generation that meet the following requirements:

6.1.4.11.1	Able to re-program meter to support bi-directional or net metering. Reprogramming of the meters to support bi-directional or net metering shall be accomplished using Elster's MeterCat software.	FR
6.1.4.11.2	Capable of programming the meter for bi-directional or net energy metering and receive acknowledgement within one (1) minute of request. Reprogramming of the meters to support bi-directional or net metering shall be accomplished using Elster's MeterCat software.	PR

6.1.4.12 Distribution Metering, Grid Sensors and Controllers

Supplier shall provide Distribution Metering, Grid Sensors and Controllers that meet the following requirements:

6.1.4.12.1	Collect reads from distribution meters at least once per day.	PR
6.1.4.12.2	Request distribution meter reads on demand.	FR
6.1.4.12.3	Record the source, type, and ID of all distribution system devices including distribution meter, grid sensor and controller data.	FR
6.1.4.12.4	Identify distribution meters, grid sensors and controllers that did not send requested read data.	FR
6.1.4.12.5	Support all AMI scheduling, diagnostic, logging, reporting and prioritization functionality for distribution meters, grid sensors and controllers to the extent that the distribution devices support those functions.	FR
6.1.4.12.6	Accommodate self registering and non-self registering distribution meters, grid sensors and controllers.	FR

6.1.4.13 Outage Detection

Supplier shall provide Outage Detection that meet the following requirements:

6.1.4.13.1	All meters and distribution grid devices shall be able to communicate energized status (i.e. has voltage).	FR
6.1.4.13.2	Detect and communicate a power outage at the premises prior to communications loss (last gasp) by meters, and if supported by distribution devices.	FR
6.1.4.13.3	Monitor and log the duration of power outages of all meters and distribution devices associated with a FAN Controller/Collector for later statistical analysis.	FR

6.1.4.14 Tamper Detection

Supplier shall provide Tamper Detection that meet the following requirements:

6.1.4.14.1	Detect potential tampering events such as reverse energy, multiple outage counts, manual demand resets, etc. REX2 meter shall be configurable to detect vibrations during power failures indicating a tilt condition.	FR
6.1.4.14.2	For each tamper event, the meter shall, at a minimum, transmit and locally log the following information: 1. Event Timestamp 2. Tamper status (event type) 3. Meter/Device ID	FR
6.1.4.14.3	Communicate tamper events to the HES as soon as they occur (when possible). If the meter/device is unable to communicate at the time the tamper event is detected, meter/device shall store tamper events and transmit them when meter communications are re-established to HES or locally to Field Tool.	FR
6.1.4.14.4	Tamper events shall be sent with a higher priority than normal status messages.	FR
6.1.4.14.5	HES to collect and log all tamper detection events sent by meters (logged with event timestamp, tamper event type, and meter/device ID).	FR

6.1.4.15 Power Quality

Supplier shall provide Power Quality that meet the following requirements:

6.1.4.15.1	Record and report momentary power interruptions per IEEE 1159/IEC 61000-4-30 standards as follows. The REX2 and A3 ALPHA meters shall support outage notification through transmission of last gasp message when they detect a power outage. The REX2 meter shall record and report the following information which can be used to calculate outage indices: • Number of momentary outages • Number of sustained outages • Cumulative time of sustained outages The A3 ALPHA meter shall record and report the following information on power interruptions: • Outage start date and time • Outage stop date and time • Outage log indicating the cumulative outage time in minutes • Power outage count	FR

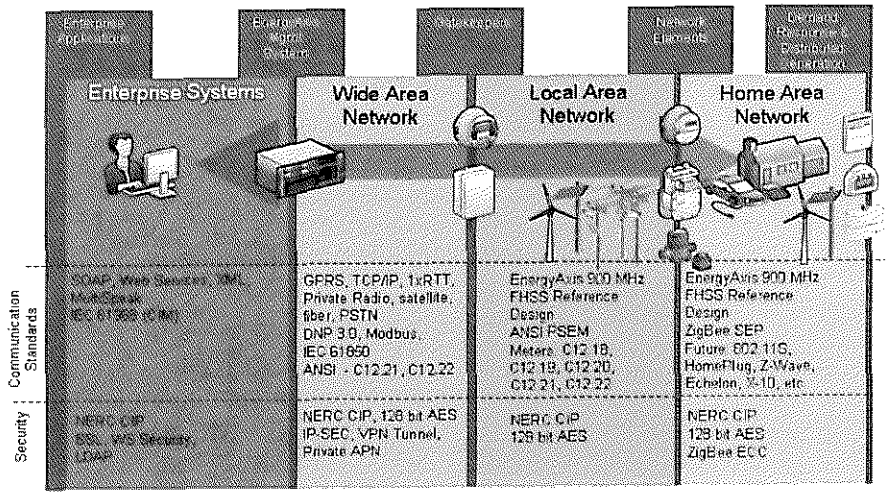
6.1.4.16 Secure Communications

Supplier shall provide Secure Communications that meet the following requirements:

6.1.4.16.1	Elster shall provide a comprehensive approach to security to ensure confidentiality, integrity, availability and auditability within the AMI network. This multi-prong approach shall include: • Access – Access enables utility personnel and outsiders to either use the system or breach the system. EnergyAxis shall control access to the network at the end devices, the Gatekeepers and the head-end. • Authentication – Authentication limits transmissions on the network to authorized devices and personnel only. EnergyAxis shall use sophisticated authentication techniques and enhance these techniques by utilizing unique keys for each device.	FR

- Encryption – Encryption prevents data from being read by unauthorized parties. EnergyAxis shall use NIST-approved encryption modes and algorithms including AES-128.
- Monitoring and Reporting – Monitoring and reporting provides the utility notification in the case of a security breach. EnergyAxis shall provide logging and reporting to allow early detection of any security issues.

The end-to-end system security is a modular design as shown in the following figure:



The Tropos GridCom system shall provide security in five areas:

1. Network access control
2. Protection of shared assets from malicious wireless users
3. Protection of wireless clients from malicious wireless users
4. Secure end-to-end data traffic transmission
5. Secure network configuration, operation and management

	The security elements in the Tropos GridCom system shall incorporate and extend industry best practices for securing wireless networks, resources and data. Tropos implements only security algorithms that have been industry-proven and verified and that have been shown to be appropriate for wireless IP broadband mesh networks. The techniques, protocols and algorithms used by Tropos, such as traffic filtering, WPA2, EAP, RADIUS, AES, HTTPS, and VPNs, shall have been employed for many years in a wide variety of Internet applications. Tropos GridCom shall combines Internet and wireless security techniques to offer a robust and multi-layered security framework.	
6.1.4.16.2	Authentication - Establish the validity of the originator of a transmission or message. Provide secure communication mechanism and configurable authentication capabilities to protect against Spoofing, Man in the Middle, replay attacks, etc. EnergyAxis shall provide comprehensive security measures throughout the network. Security features shall be built into the end devices, the Gatekeepers, the radio communications, and the network management system as described below: **Security in the Network Element Devices** The end devices (meters and distribution nodes and sensors) can be accessed locally via an optical port or remotely via the EnergyAxis 900 MHz radio system. Access to the devices via the optical port requires an optical port password. A valid password is necessary to read data from or write data to the meter. The optical port password is set per the customer's factory configuration and can only be changed by the utility using Elster's meter configuration software. It is recommended that the utility maintain a policy of disclosing passwords for meter access on an as-needed basis only. The EnergyAxis 900 MHz local area network (LAN) uses a frequency hopping spread spectrum (FHSS) radio. FHSS systems are typically used in unlicensed frequency bands where multiple radio systems may co-exist. FHSS systems are also used in critical applications where security is vital (such as military communications) because they enhance the security of radio transmissions. The inherent enhancement of security in FHSS systems is due to the pseudo-random nature of the radio communications. The EnergyAxis System transmits each packet of data on one of 25 available channels. The next data packet is transmitted on another channel in a pseudo-random channel selection process that provides immunity to eavesdropping and interception. In addition to the security provided by the FHSS radio in the end devices, additional security is provided through the use of AES-128 encryption. As part of the EnergyAxis System, the devices can be configured to only respond to data requests (reads or writes) if the command is properly encrypted. If the request is not properly encrypted, the meter will not acknowledge the request as valid (NAK). The meter will not comply with the request and the NAK is identified as an invalid radio access attempt. This combination of an FHSS system and AES-128 encryption prevents	FR

direct tampering. In 2010, the EnergyAxis System will provide an easily manageable key infrastructure to allow utilities to manage the security key updates as needed, providing unique keys for every device across the LAN and reducing the complexity of key management.
The AES-128 encryption method was chosen for the EnergyAxis System because it provides superior security compared to most alternatives. For example, NIST SP800-57a (from the National Institute of Standards and Technology) specifies a crypto-period of no later than 2010 for ECC-160, while AES-128 encryption is recommended for use through and beyond the year 2030.
Without the possibility of direct tampering, an adversary may attempt indirect methods of tampering such as packet replay attacks. In a packet replay attack, an adversary stores a radio transmission and replays the transmission at a later time. One might attempt of this type of attack to cause the system to respond in a way that changes control or billing parameters at the meter site. For example, an adversary might attempt to store load control or pricing commands to replay at a later time. EnergyAxis devices have anti-replay mechanisms that use date/time stamps in each radio transmission to prevent messages from being stored and replayed at a later time.

Security in the Gatekeepers

A Gatekeeper is typically remotely accessed via the WAN, but can also be accessed locally via an optical port. Access to the Gatekeeper via the optical port requires an optical port password. A valid password is necessary to read data from or write data to the Gatekeeper. The optical port password is set per the customer's factory configuration and can only be changed by the utility using Elster's meter configuration software. It is recommended that the utility maintain a policy of disclosing passwords for meter access on an as-needed basis only.
Gatekeeper WAN access is authenticated using a DES encryption of a randomly generated token. Encryption of the data transmitted between the Gatekeeper and the network management system is dependent on the underlying WAN (GPRS/EDGE/HSDPA, CDMA/1xRTT/EVDO, etc). For wireless WAN networks, telecommunication companies utilize private networks and encryption to secure data transmissions. The WAN modem in the Gatekeeper has password protection and supports Custom Access Point Nodes (APN) making the modem's IP address private and not exposed to the public internet. GPRS devices can be set up on custom APNs and made to appear as if they are from within the utility intranet so that the IP address is inaccessible from outside the corporate intranet. In 2009, additional security is provided with the delivery of the Smart WAN card, which provides ANSI C12.22 protocol support for access over the WAN. With the inclusion of C12.22, AES-128 will provide the authentication and encryption functionality. EnergyAxis will provide an easily manageable key infrastructure to allow the utilities to manage the security key updates as needed, providing unique keys for every device across the WAN, as well as the LAN.
LAN communications to and from the Gatekeeper use the same FHSS 900 MHz radio as described above. The security mechanisms, including AES-128 encryption, are the same as discussed for the

	EnergyAxis network element devices. It is important to note that the Gatekeeper does not accept LAN commands via the EnergyAxis 900 MHz radio that requests it to initiate LAN activity. Such commands are accepted only via the WAN connection. This design feature denies an adversary any possibility of using a 900 MHz radio to control the Gatekeeper's activities or gaining control access to the LAN. **Security at the EnergyAxis Management System** The EA_MS resides within the corporate intranet and thus all security mechanisms that the utility has in place for its enterprise security are the primary mechanisms for securing access to the EA_MS. Each EA_MS user is authenticated using a built-in user name and password mechanism. Passwords can be forced to expire periodically by the system administrator. If necessary, user authentication, access control and identity management can be tied to an enterprise LDAP directory or other central scheme. The network management system provides role-based access control: System Administrator, Meter Services User, Billing and CIS User, and Report Only User. Each user obtains access to the system via a unique username/password. Access to system functions is limited by the assigned role. The Tropos GridCom communications network proposed for the backbone/WAN will facilitate secure throughout the entire system. Further, the Tropos GridCom network supports WPA2, 802.11i, RADIUS, 802.1x (including EAP-TLS, EAP-TTLS, EAP-SIM, PEAP) authentication. The Tropos multi-layer security architecture prevents man in the middle and replay attacks through the use of AES encryption and 802.1x RADIUS Authentication to users and end-point devices like meters and data collectors. Because hackers can spoof the MAC address of a valid endpoint, MAC address based authentication, while an effective element in a layered security architecture, should not be the only authentication mechanism used. For a more detailed description of the Tropos multi-layer security architecture, please see the GridCom security discussion of in the Narrative Description of the Network Architecture (response to Section 6.0).	
6.1.4.16.3	Authorization – Provide verification of an individual's right to access specific system resources. Authorize all communications on the AMI network (utility and 3rd party messaging) and reject and log messages received from unauthorized systems/devices. This includes messages being transported on backhaul network WAN and across FAN. Authorization shall be implemented as described below: Each EA_MS user is authenticated using a built-in user name and password mechanism. Passwords can be forced to expire periodically by the system administrator. If necessary, user authentication, access control and identity management can be tied to an enterprise LDAP directory or other central scheme.	FR

	The network management system provides role-based access control: System Administrator, Meter Services User, Billing and CIS User, and Report Only User. Each user obtains access to the system via a unique username/password. Access to system functions is limited by the assigned role. • Reports Only users – Can only run reports and see their own activities in the activity monitor. • CIS Operators – In addition to the above, the CIS users can perform some configuration functions such as meter setup, meter connect and meter disconnect. • Meter Services Users – Can perform more advanced functionality to the meter such as resetting event logs, manual demand resets, acknowledge meter alarms, etc. • System Administrators – Have access to all functions and can create user accounts and monitor user activities across the system. EA_MS provides an Activity Monitor enabling the system administrator to: • View log of each user's activities • View specific meter, account etc. that were involved in the transaction and the parameters sent Every operation executed by a user from the web application, along with timestamps and user IDs is logged and can be reported. Programmatic interfaces and batch operations are also logged in a similar fashion. If necessary, device data transferred between the EA_MS and other enterprise systems can be encrypted using either symmetric or asymmetric encryption algorithm. Elster currently utilizes RSA with OAEP (RSA/OAEP) for the Asymmetric Cipher Algorithm and Triple DES (DESede) for the Symmetric Cipher Algorithm, for data being exported from the EA_MS. The Tropos GridCom communications network proposed for the backbone/WAN will facilitate secure throughout the entire system. Further, the Tropos GridCom network supports WPA2, 802.11i, RADIUS, 802.1x (including EAP-TLS, EAP-TTLS, EAP-SIM, PEAP) authentication. For a more detailed description of the Tropos multi-layer security architecture, please see the GridCom security discussion of in the Narrative Description of the Network Architecture (response to Section 6.0).	
6.1.4.16.4	Confidentiality - Provide assurance that information is not disclosed to unauthorized persons, processes, or devices. Elster shall provide a comprehensive approach with security to provide confidentiality, integrity, availability and auditability within the network. This multi-prong approach shall include: • Access – Access enables utility personnel and outsiders to either use the system or breach the system. EnergyAxis controls access to the network at the end devices, the Gatekeepers and the head-end.	FR

	• Authentication – Authentication limits transmissions on the network to authorized devices and personnel only. EnergyAxis currently uses sophisticated authentication techniques and is enhancing these techniques even further by utilizing unique keys for each device. • Encryption – Encryption prevents data from being read by unauthorized parties. EnergyAxis uses NIST-approved encryption modes and algorithms including AES-128. • Monitoring and Reporting – Monitoring and reporting provides the utility notification in the case of a security breach. EnergyAxis provides logging and reporting to allow early detection of any security issues. Tropos GridCom backbone/WAN shall encrypt data via a combination of WPA2 and AES	
6.1.4.16.5	Data Integrity - Provide assurance that data is unchanged from its source and has not been accidentally or maliciously modified, altered, or destroyed. Supplier shall support this requirement as described in 6.1.4.16.4. Tropos GridCom backbone/WAN shall support Layer 2, 3 and 4 checksums for data integrity.	FR
6.1.4.16.6	Non-repudiation - Provide assurance that the sender of data is provided with proof of delivery and that the recipient is provided with proof of the sender's identity, so neither can later deny having processed the data. Supplier shall support this requirement as described in 6.1.4.16.4.	FR
6.1.4.16.7	Availability - Provide assurance that allowing the sharing of information will not create situations in which authorized users are denied service. This includes an intrusion prevention system that monitors communications, infers when an attack is occurring and notifies components of the AMI Solution to take action. System shall take direct action to block malicious traffic and malformed messages. Supplier shall support this requirement as described in 6.1.4.16.2.	FR

6.1.4.17 System Performance Requirements

Supplier shall provide System Performance Requirements that meet the following requirements:

6.1.4.17.1	Provide full system high availability (99.9%).	PR
6.1.4.17.2	Provide a secure communication mechanism and configurable authentication capabilities to protect against Spoofing, Man in the Middle, replay attacks, etc.	PR
6.1.4.17.3	Have adequate online data storage capacity to ultimately support the scalability requirements indicated in requirement 6.1.0.	PR

6.1.4.17.4	Receive, log, and return requests for on-demand meter data (up to 24 hours of data) within 60 seconds of the meter receipt.	PR
6.1.4.17.5	Receive, log, and return requests for on-demand meter data (up to 45 days of data) within 5 minutes of the meter receipt.	PR
6.1.4.17.6	Issue and receive results for on-demand read requests from the meter within ten (10) seconds, 80% of the time, but at no time longer than 30 seconds.	PR
6.1.4.17.7	HES shall transmit energy related information over FAN Controller/Collector to premises meter display device within one (1) minute.	PR
6.1.4.17.8	HES shall provide a system dashboard that contains a series of Adobe FLEX pods that capture metrics on both the WAN and LAN network performance.	PR
6.1.4.17.9	Shall provide the capability to verify operational status of each electric elements and FAN controller/collector based on periodic schedule or on-demand request	PR
6.1.4.17.10	Send safety/service failure events within five (5) minutes of detection.	PR
6.1.4.17.11	Allow authorized SVP employees (while on-site at the customer premises) to operate the service disconnect/reconnect switch immediately (regardless of interval).	PR
6.1.4.17.12	Support delivery of disconnect/reconnect event messages to the meter that are persistent until the meter acknowledges event status or the event is ended.	PR
6.1.4.17.13	Support transmitting remote disconnect/ reconnect/limiting commands to the meter and the command be executed within 60 seconds of the request being sent.	PR
6.1.4.17.14	Automatically retry transmitting disconnect/reconnect scheduled operations to the meter if it does not receive an acknowledgement within 60 seconds of the original transmission.	PR
6.1.4.17.15	High priority messages exchanged between the Head-End System and premises and/or field devices will be delivered in 10 seconds 80% of the time, but in no case longer than one (1) minute.	PR
6.1.4.17.16	Medium priority messages exchanged between the Head-End System and premises and/or field devices will be delivered in 30 seconds 80% of the time, but in no case longer than two minutes.	PR
6.1.4.17.17	Low priority messages exchanged between the Head-End System and premises and/or field devices will be delivered in one minutes 80% of the time, but in no case longer than five minutes.	PR

6.1.4.17.18	HES shall provide a system dashboard with performance metrics including but not limited to: 1. Success and failure key performance indicators (KPIs) for scheduled operations such as percent of meter successfully read 2. End-to-end connectivity performance for both WAN and LAN services.	PR
6.1.4.14.19	HES shall support a web service interface that specifically allows external systems to issue requests for transmitting event and account information. Use of this interface requires that the interfacing system (MDM or other) develop the logical connector/adapter to issue the correct calls and work flow to the HES accomplish the desired objective. Elster's web service interfaces are published to allow enterprise providers to execute the necessary integration effort. Elster also provides basic support on the proper use of the web service interfaces. This basic support is limited to the logical interface itself. Consultation on business work flow and scoping of the overall integration effort is also available but has not been included in the existing Elster offering.	PR

6.2 OPTIONAL/FUTURE FUNCTIONAL REQUIREMENTS

The Supplier, Elster, shall provide a complete Advanced Metering System, known as Energy Axis Management System (EA_MS), including field communication hardware, electrical and water meters, Elster REX2, A3 ALPHA, AMCO, and support equipment and software as indicated in the following optional requirements below:

6.2.1 Meters – Electric

Supplier shall provide Meters – Electric that meet the following requirements:

6.2.1.1	Configure with appropriate tariff/rate program at installation time (updated from default configuration).	FR
6.2.1.2	Remotely configure to record the customer's current TOU consumption on the REX2 meter so that it can display the current TOU tier for kWh-delivered on a premises HAN device and/or meter display.	FR
6.2.1.3	Measure harmonics level data according to IEC 61000-4-7 and IEEE 519 for voltage and current. Elster shall provide as an orderable option the A3 ALPHA commercial and industrial meter with the power quality measurement (PQM) that can measure second harmonic current, total harmonic distortion current, and total harmonic distortion voltage.	PR
6.2.1.4	Monitor voltage in order to detect an RMS (Root Mean Square) voltage variation according to IEC 61000-4-30 and IEEE 1159 standards. Detect and log RMS variation based on magnitude, duration, and direction. (per phase, aggregate)	FR

6.2.1.5	Allow on demand retrieval of power quality data including detailed RMS variation events and detailed harmonics information locally with using the Metercat software installed on a standard laptop computer by authorized SVP employees.	FR
6.2.1.6	Correlate tamper events with planned meter maintenance may be considered in a future scope of work. Consultation on business work flow and scoping of the overall integration effort is available but has not been included in the existing Elster offering.	FR
6.2.1.7	Capable of storing and returning event based power quality information until read. Data to persist until overwritten.	FR
6.2.1.8	Send all meter display information and messages to the customer local display device (the device must meet SVP standards – see 6.1.1.1 above).	FR
6.2.1.9	Provide date and time in "local time," displaying the time in Pacific Daylight Time or Pacific Standard Time as appropriate.	FR
6.2.1.10	AMI solution does not support the capability to remotely configure to record the customer's current bill cycle schedule (start/end date and number of days) so that it can be displayed on a local display device and/or meter display.	FR
6.2.1.11	AMI solution does not support the capability to display pending, active and ended event messages. Include the event type, event schedule date/time (start and end), hourly/time-of-use pricing and customer cost.	FR
6.2.1.12	Able to display the date and time (local time) when the event information was last received/updated locally. Data to persist until overwritten. (e.g. event notification received mm/dd/yy, 10:00 a.m.).	FR
6.2.1.13	Transmit utility messages and/or energy information to a display device and/or load control equipment within ten (10) seconds of being received or recorded by the meter.	PR
6.2.1.14	Execute and log local meter display provisioning and configuration requests on the A3 ALPHA meter using the Metercat software loaded on a standard laptop or desktop computer.	FR
6.2.1.15	Configurable to customize customer individual information attributes as available for display on the A3 ALPHA meter using the Metercat software loaded on a standard laptop or desktop computer.	FR
6.2.1.16	Remotely initiated meter display configuration on the REX2 meter, such as TOU tiers, within 60 seconds of being received. Configuration of the display on the A3 ALPHA shall be through its optical port using Metercat software loaded on a standard laptop or desktop computer.	PR
6.2.1.17	Remotely configurable to record the energy consumed and generated in kWh, in time-of-use (TOU) periods, for cumulative registration so that it can be displayed on the meter LCD.	FR

6.2.1.18	Configurable to record the peak demand in kW (consumed and generated) recorded to date in cumulative registration with the date/time when it occurred so that it can be displayed on the meter LCD.	FR
6.2.1.19	AMI meter does not support the capability to display consumption for the last completed recording interval. This information shall be stored within the meter's memory for retrieval by the HES.	FR
6.2.1.20	REX2 meter shall display the instantaneous demand for kWh-delivered so that it can be displayed on the meter local display or its premise device. The A3 ALPHA shall be configurable to display instantaneous demand for kWh-delivered through its optical port using Metercat software.	FR
6.2.1.21	REX2 meter shall display the instantaneous demand for kWh-delivered so that it can be displayed on the meter local display or its premise device. The A3 ALPHA shall be configurable to display instantaneous values such as volts, amps and VARs through its optical port using Metercat software.	FR
6.2.1.22	Report restoration information (voltage quality and quantity).	FR
6.2.1.23	Elster does not support the capability to configured the disconnect switch to open during an overvoltage event when a certain set thresholds are reached.	FR
6.2.1.24	Elster does not support the capability to reconnect automatically after voltage has returned to and remained within configurable voltage thresholds for a configurable amount of time.	FR

6.2.2 FAN Controller/Collector

Supplier shall provide FAN Controller/Collector that meet the following requirements:

6.2.2.1	Retrieve logs on demand from meters and all FAN Controller/Collector components (including premises gateways) within 60 seconds of the request.	PR
6.2.2.2	Identify the probable cause of a communications failure within the FAN Controller/Collector.	FR

6.2.3 Head-End System

Supplier shall provide Head-End Systemthat meet the following requirements:

6.2.3.1	Communicate event messages to 500 AMI meters within ten (10) seconds.	PR
6.2.3.2	Communicate event messages to all AMI meters within one (1) minute.	PR
6.2.3.3	Critical messages exchanged between the HES and meter/distribution devices will be delivered in ten (10) seconds.	PR

6.2.3.4	HES shall automatically rebalance default meter read groups on a periodic basis in order to balance/optimize the overall meter read schedule performance. Rebalancing shall be accomplished as described below: EnergyAxis shall achieve automatic rebalancing through utilization of distributed intelligence in all layers of the network: the server hardware, server software, gatekeepers and network endpoints. EnergyAxis software and hardware shall support parallel communication sessions where commands are being executed simultaneously. The server software shall maintain the latest registration of network endpoints where the HES can combine to a single command that is issued multiple endpoints registering to the same gatekeeper. This action shall minimize the WAN traffic and maximizes communication efficiency. The gatekeepers and network endpoints shall support self-registration, self-healing, and self-optimization. These algorithms shall ensure that the network endpoints have reliable LAN communication to its gatekeeper at all time.	FR
6.2.3.5	HES shall record the results of read group analysis and the resulting actions taken. Refer to 6.2.3.4.	FR
6.2.3.6	Request and receive results from HES for an automatically initiated group on demand read.	FR
6.2.3.7	HES does not support the capability to communicate informational messages in English or Spanish language	FR
6.2.3.8	HES shall prioritize all messages (event and informational) that are sent to the meter, customer's HAN devices (display, load control, etc.), and other customer designations such as e-mail, cell phones, etc. (customer display devices must meet SVP standards). See response for 6.1.2.3.	FR
6.2.3.9	HES shall support multiple message prioritization schemes. Each scheme will support prioritizing and limiting messages (event and informational) by end device, message type, source and destination. The priority and limits by class, source and destination shall be configurable by the utility. See response for 6.1.2.3.	FR
6.2.3.10	HES does not support the capability to enable alerting when configured messaging limitations are exceeded.	FR
6.2.3.11	HES shall provide a Meter Communication Summary Report where it summarizes the communication success/failure statistics.	FR
6.2.3.12	Interface with the Outage Management System (OMS) to provide outage/ restoration information from the AMI Solution for many meters over a short period of time. System shall be 99.9% accurate in reporting outages so that repair crews can be dispatched to the correct locations. The EnergyAxis System supports utility Outage Management Systems by providing power outage and power restoration data from its meters. Outages and restorations may also be published to an enterprise message bus or sent to an Outage Management System using a web service. The outage detection interface supports the MultiSpeak standard and has been certified interoperable by the standard body.	FR

6.2.3.13	Report outage/restoration information to OMS within 1-5 minutes as described below: Several scenarios for outage are described below, based on the system being fully deployed as recommended by the Elster project team. The latency of outage notifications will depend on numerous factors, including: • Configured thresholds / delays for the gatekeeper to communicate outage notifications to the EA_MS. • Type and configuration of WAN communications (GPRS, 1xRTT or Tropos Network are low latency WANs). The typical values below are based on a very low latency WAN. • Rules established for filtering outage notifications at the gatekeeper. For example, whether or not outages are to be verified before reporting, and whether or not outages are to be reported at the time of occurrence if a restoration occurs before the outage notification is transmitted to the EA_MS.	PR

Outage type	Affected customers	Typical response latency	Reliability within latency timeframe
Single Customer Sustained Outage (Single No-light Secondary Outage).	1	< 1 min	> 99%
Multiple Secondary or Transformer Sustained Outages	< 100	< 5 min	> 95%
Small Scale Sustained Outage (Multiple Primary Outages).	100 - 500	< 10 min	> 90% *
Medium Scale Sustained Outage (Primary Outage)	501 - 2000	< 10 min	> 90% *
Large Scale Sustained Outage (Primary Outage)	> 2000	< 10 min	> 90% *

* A benefit of the mesh architecture is that it will inherently throttle outage reports in large scale events, while still providing sufficient outage reports to positively define the outage extent or borders of the outage area. EnergyAxis outage reports combined with the OMS knowledge of the distribution topology will allow

	positive identification of protective devices which have operated, thus allowing determination of all devices in outage. Reliability of reports within the latency timeframe noted are for devices which have an available path for outage reporting.	
6.2.3.14	Enable harmonics data collection that follows IEC 61000-4-30 (Class B and IEEE 519) standards on A3 ALPHA meters. Information on PQM tests can be retrieve locally using the Metercat software installed on a standard laptop computer. Remote retrieval of PQM data on the A3 ALPHA meter from the HES is planned for future implementation.	PR

6.2.4 Premises Gateway – Home Area Network (HAN)

Supplier shall provide Premises Gateway – Home Area Network (HAN) that meet the following requirements:

6.2.4.1	Capable of supporting a HAN.	PR
6.2.4.2	Physically located under the cover of the REX2 meter.	PR
6.2.4.3	Time-synchronized with an external time source at least once per day.	FR
6.2.4.4	Remotely test communications with customer devices attached to a HAN.	FR
6.2.4.5	Securely route messages between the FAN and the customer's HAN for the purpose of monitoring/controlling/programming customer devices.	FR
6.2.4.6	Receive event messages from HAN devices (e.g. customer's local display device) and securely route them through the FAN.	FR
6.2.4.7	Require unique IDs for HAN-connected customer equipment to enable remote communications between the utility and specific customer equipment.	FR
6.2.4.8	Detect failures in communicating with subscribed HAN devices and report exceptions to the HES.	FR
6.2.4.9	AMI solution shall support a DA gateway in the future providing IP access (but not executing operations) to distribution devices and serving as 900 MHz EnergyAxis gatekeeper.	FR
6.2.4.10	Differentiate between multiple individual generators at a customer site over HAN.	FR
6.2.4.11	Log messages sent between the HES and the HAN connected devices via Premises Gateway over FAN.	FR
6.2.4.12	Send HAN device message log information to the HES according to a regular schedule (configurable frequency) or on demand via Premises Gateway over FAN.	FR
6.2.4.13	HES shall provide the capability to retrieve events on a daily basis.	FR

6.2.4.14	Remotely request self-test of customer equipment that is accessible over customer HAN (if supported by customer equipment). ZigBee command sets do not support self test. However, Elster does support sending a sample messages to the end device to simulate a self test. (Note this may be changing for ZigBee.)	FR
6.2.4.15	Enable customer notification of communication status with HAN devices within two (2) minutes of enrolling them.	PR
6.2.4.16	This requirement is deleted.	FR
6.2.4.17	EA_Inspector Field Tool supports 900 MHz devices and does not have the capability to support ZigBee HAN.	FR
6.2.4.18	HES shall support the capability to commission and de-commission ZigBee HAN devices.	FR

6.2.5 Demand Response (DR)

Supplier shall provide Demand Response (DR) that meet the following requirements:

6.2.5.1	AMI Solution shall be able to interface to DR System.	FR
6.2.5.2	AMI Solution shall be able to automatically launch and terminate demand response events, once it has received the event message by the HES.	FR
6.2.5.3	AMI Solution shall be able to receive and process demand response event cancellations or reschedule messages.	FR
6.2.5.4	AMI Solution shall be able to log demand response events and send acknowledgement of successful processing to DR System.	FR

6.3 MANDATORY TECHNICAL REQUIREMENTS

The Supplier, Elster, shall provide a complete Advanced Metering System, known as Energy Axis Management System (EA_MS), including field communication hardware, electrical and water meters, Elster REX2, A3 ALPHA, AMCO, and support equipment and software as specified in the following mandatory technical requirements below:

6.3.0 Standards and Recommended Practices

Supplier shall support Standards and Recommended Practices that meet the following requirements:

6.3.0.1	Elster shall support and promote open standards, architectures, interfaces and systems in all their products. A description of their approach is as follows:	FR

Adherence to Open Architectures

The EnergyAxis System is built upon platforms that utilize open architectures. The system runs on the Windows OS platform and supports multiple hardware platforms; Hewlett-Packard (HP), IBM and Dell. The EnergyAxis Management System (EA_MS) utilizes ORACLE as a standard off-the-shelf RDBMS component as well as the open source Tomcat Web Server. From an open architecture point of view, the EA_MS provides

- Standard XML based interfaces that easily integrate with enterprise systems for MDMS, Billing, OMS, Demand Response, etc.
- A WAN agnostic TCP/IP approach that enables multiple WAN technologies such as GPRS, CDMA, 1xRTT, WiFi and BPL through the EnergyAxis Ethernet Gatekeeper.
- Interoperability with third party devices for Home Area Network using either the EnergyAxis 900 MHz or ZigBee-based radio protocols.
- Interoperability with third party devices for value-add applications such as prepayment.

Adherence to Open Standards

Across the system, whether at the interface from the data management system or at the end device, Elster supports and utilizes open standards.

In the data management system, EnergyAxis enables utilities to easily automate their business processes and streamline the AMI data flow across various enterprise systems by utilizing industry standard interfaces. These enterprise systems include CIS, Billing, OMS, GIS, Asset Management, MDMS, Work Management, etc. A key aspect of the software and system architecture for the EA_MS is the integration capability at the enterprise level within the utility. The system architecture supports both Service Orientation Architecture (SOA) and event driven integration to enterprise systems. The EA_MS provides independent services with defined interfaces for integration and complete automation with the utility back office systems.

Following the SOA principles, these services are independent of the underlying implementation technology and do not require any knowledge by the calling application of how the service performs its work. These Web Services expose the underlying smart grid functionality required to configure end-devices or the network, and retrieve end-device/network status, metered data, alarms, events, or other distribution related data. The service interfaces are loosely coupled and granular tasks can be combined by the utility back office systems to create different business processes.

A unique feature of the interface is a simple sequencing and control mechanism via the XML format, which in conjunction with service modularity, enable these services to be combined or modified into different business process integration with utility back office systems. In addition to Web Service

interfaces, the EA_MS also uses XML formats for publishing metering data and statuses, provides a WAN agnostic solution through the use of TCP/IP, and utilizes the C12.21 metering protocols for meter device communication. The EnergyAxis Gatekeeper supports ANSI 12.22, an open standard for IP communications to meters.

Adherence to n-tier Architectures

The EA_MS uses a multi-threaded, multi-tasking, asynchronous architecture with the specific intent of supporting high volume of data collection. It follows a modular n-tier architecture in which individual components utilize either Web Services or publish-subscribe mechanisms for inter-process communications. The architecture can be loosely classified into three layers:

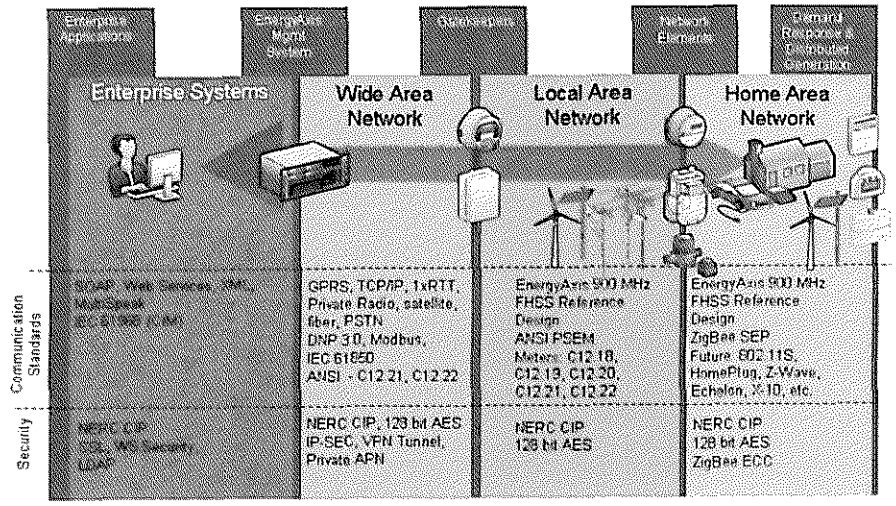
- Web application and the web server: This consists of Tomcat and the Web application itself, which is written in JSP, Java and utilizes the Struts framework.
- Application server: This comprises multiple components for collection, packaging and publishing data as well as for providing integration interfaces for upstream systems.
- Database and data access layers: This comprises an embedded Oracle instance and application server components that provide access to the database from the application servers.

The Application server consists of individual components to enhance the modularity of the architecture and improve the extensibility, reliability and scalability of the overall system.

ANSI Metering Standards

Elster's AMI meters are compliance to the following suites of revenue metering standards where applicable:

- ANSI C12.1
- ANSI C12.10
- ANSI C12.16
- ANSI C12.18
- ANSI C12.19
- ANSI C12.20
- ANSI C12.21
- ANSI C12.22
- FCC Part 15 Class B



The Tropos GridCom communications system conform to a wide variety of industry standards and has achieve a wide variety of certifications including 802.11a/b/g/n, 10/100BASE-T, 802.1q, 802.11e, 802.1p, RADIUS, HTTPS, SSH, SNMP, WPA2, 802.11i, 802.1x (including EAP-TLS, EAPTTLS, EAP-SIM, PEAP), TKIP, AES-CCM, FIPS 140-2 Level 2, NERC-CIP 002-009, ASTM B117, ETSI 300-19-2-4 spec T41.E class 4M3, ISTA 2A, FCC CFR 47 Part 15, Class B, Industry Canada RSS 210, EN 301 489-17, EN 300 328, EN 301 893, EN 60950, IEC 950, UL 60950-1, CSA 22.2 No. 60950-1, UL 579/IEC 60529 IP67 rated for outdoor use, UL 1449/IEC 60664-1, CE!, ANSI/IEEE C62.41, UL 1449-2nd ed., 10kA @8/20 µS Wave form, 36kA per phase, L-L, L-N, L-PE, EN61000-4-5 Level 1 & 2 AC Surge Immunity, EN61000-4-4 Level 2 Electrical Fast Transient Burst Immunity, EN61000-4-3 Level 2 EMC Field Immunity, EN61000-4-2 Level 2 (contact), Level 3 (air) ESD immunity.

6.3.0.2	The following table indicates Elster's support/implementation plans for adopted NIST Interoperability Standards including:	FR

Standard	Application	Elster's Response
AMI-SEC System Security Requirements	Advanced metering infrastructure (AMI) and Smart Grid end-to-end security	Requirements are not finalized by either AMI-SEC or NIST. Elster is participating in the evolving standards and the NIST process and is committed to implementing them as appropriate for our technology.
ANSI C12.19/MC1219	Revenue metering information model	Fully implemented in the EnergyAxis metering endpoints.
BACnet ANSI ASHRAE 135-2008/ ISO 16484-5	Building automation	Not applicable to the proposed technology.
DNP3	Substation and feeder device automation	Available in some products.
IEC 60870-6 / TASE.2	Inter-control center communications	Not implemented
IEC 61850	Substation automation and protection	Not implemented
IEC 61968/61970	Application level energy management system interfaces	Fully implemented and will be participating in the first formal interoperability testing sessions in Fall of 2009.
IEC 62351 Parts 1-8	Information security for power system control operations	Not applicable
IEEE C37.118	Phasor measurement unit (PMU) communications	Not applicable
IEEE 1547	Physical and electrical interconnections between utility and distributed generation (DG)	Not applicable
IEEE 1686-2007	Security for intelligent electronic devices (IEDs)	Not applicable
NERC CIP 002-009	Cyber security standards for the bulk power system	Elster complies with the NERC CIP requirements and has had an independent audit of our system for compliance.
NIST Special Publication (SP) 800-53, NIST SP 800-82	Cyber security standards and guidelines for federal information systems, including those for the bulk power system	System engineering used these guidelines where applicable.
Open Automated Demand Response (Open ADR)	Price responsive and direct load control	OpenADR is still a work in progress and is not implemented.
OpenHAN	Home Area Network device communication, measurement, and control	OpenHAN is still a work in progress and is not implemented.
ZigBee/HomePlug Smart Energy Profile	Home Area Network (HAN) Device Communications and Information Model	Elster's current ZigBee HAN technology meets SEP 1.0 and we are in the process of being certified by the ZigBee Alliance. Elster is participating on the ZigBee Alliance Marketing and Technical Requirements Working groups, which is shaping the next SEP specifications.

Clarification: Elster's response to the individual standard in included in the third column of the above table.

Additionally, NIST's web site (www.nist.gov) provides the following clarifications: "NIST is mandated by Congress in the Energy Independence and Security Act (EISA) of 2007 to coordinate the development of a framework of protocols and model standards to achieve interoperability of the Smart Grid. The initial set of standards and specifications listed in the box below for inclusion in Release 1.0 of the Smart Grid Interoperability Standards Framework. Release 1.0 is a work in progress. It is not complete, nor is it exclusionary. Existing standards that do not appear in this first installment to Release 1.0 have not been eliminated from consideration. Moreover, standards currently on the list ultimately may not be included."

To this end, Elster is closely involved in monitoring and shaping the final Standards Framework. Elster has implemented or committed to implementing those standards that 1) apply to our technology and 2) we believe will ultimately become standard. Elster believes interoperability and standardization is desirable and necessary for the smart grid to become reality and we are committed to supporting an open, standard technology.

Tropos GridCom system supports NERC-CIP 002-009 as well as the security requirements specified in NIST's FIPS 140-2.

6.3.1 System Configuration and Scalability

Supplier shall provide System Configuration and Scalability that meet the following requirements:

6.3.1.1	Support separate development/test, training and production environments.	FR
6.3.1.2	Support the meter populations as indicated in requirement 6.1.0.	FR
6.3.1.3	AMI solution shall scalable to support 15 minute interval reads from all meters and down to five (5) minute for a subset of 2,000 meters.	FR

6.3.2 System Management

Supplier shall provide System Management that meet the following requirements:

6.3.2.1	AMI solution shall support in EA_MS release 8.5 the capability to monitor and generate notifications and alarms for individual processes, group of processes, and work or data flows within the system to ensure reliable operation.	FR
6.3.2.2	Elster shall implement companies Business Continuity and Disaster Response Plan as described in the proposal.	FR

6.3.3 Data Validation and Exception Handling

Supplier shall provide System Management that meet the following requirements:

6.3.3.1	Detect and prevent logical data errors when the data is input either by user entry or data files imported from other systems.	FR

6.3.3.2	For applications using a web-based user interface, the system shall support validation of all form fields processed on a client request. This will include user input fields, select options, checkboxes, radio buttons, hidden fields, valid data type, data length, valid character ranges, etc.	FR
6.3.3.3	Any data error shall not affect system functions that are not directly associated with it.	FR
6.3.3.4	Generate an error code and description which can be used to help facilitate debugging end user problems. Error code must be referenced to the actual exception generated.	FR

6.3.4 Database

Supplier shall provide Database that meet the following requirements:

6.3.4.1	Application software shall be compatible with Oracle or SQL Server.	FR
6.3.4.2	Not require Database Administrator (DBA) or system level authority.	FR
6.3.4.3	Support automated data storage and retrieval.	FR
6.3.4.4	AMI solution shall support warm backup and recovery of its database, either incrementally or in whole, without stopping any operational processes.	FR

6.3.5 User Environment

Supplier shall provide User Environmentthat meet the following requirements:

6.3.5.1	Include context sensitive online help.	FR
6.3.5.2	Provide a web-based client for browsing the data and making changes as detailed in the functional requirements outlined above. The client should support viewing usage data, receiving and acknowledging event notifications and alarms, initiating and viewing reports, modifying configurations, and initiating and updating service requests. Web clients should be compatible with the industry's leading browsers, e.g. Internet Explorer, Firefox, etc.	FR

6.3.6 System Configurability

Supplier shall provide System Configurability that meet the following requirements:

6.3.6.1	HES shall allow SVP to set up or change user screens, and alarm/event notifications without modifying source program code and without any proprietary language skills.	FR
6.3.6.2	This requirement is deleted.	FR

6.3.6.3	This requirement is deleted.	FR
6.3.6.4	HES shall support the capability to apply configuration changes to the user profile without system restart.	FR

6.3.7 Report Generation

Supplier shall provide Report Generation that meet the following requirements:

6.3.7.1	The standard reports and trend analysis provided by the EnergyAxis System is described as follows:. The EnergyAxis System offers numerous reports and HTML displays to assist in system operation and maintenance. These include: **Network Management Dashboard** (refer to the response to question 6.3.5.2) • Schedule Metrics • WAN Metrics • LAN Metrics • Geographical Network View **System Activity Monitor** • View log of each user's activities • System Dashboard – View Key Alarms and Statuses (outage, restoration, tamper). Dashboard is configurable for each user. **System Administration** • User Creation, Configuration, and User Management Reports **System Operation** • Meters - View meter information/parameters, List of meters for different criteria, Inventoried units, Installed units, Disconnected units, Meter readings, Meter events/status/alarms, Associated Gatekeepers, Associated schedules Add New, Modify, and Delete Functions – for Meters, Meter Reading Schedules, Download Schedules, and Data Sets TOU Meter Programs – Import/Overwrite, View, Exchange, Delete, and Download. Perform on-request meter reading Perform Service connect/disconnect operations • Network Management – view Gatekeepers and associated Nodes, Node-jumping history, Gatekeeper LAN performance, and network capacity • LAN Information Report – allows paths to any meter to be viewed, along with hop performance statistics Support for circuit-switched (dial-up) and static IP-addressable connections to Gatekeepers and meters	FR

	Schedule Operation • View reports – Execution list, Performance statistics, View Readings • View Meters not read • Configurable number of standard re-tries for each on-demand or scheduled meter reading. • Schedule performance reports – meters that are not read for a given schedule are identified to enable the operator to request a schedule re-submission to pick up the previously un-read units. **Home Area Network Reports** • Events Listing • Critical Tier Override Listing • Assigned / Unassigned Home Area Device Listing • Energy Conservation Listing • Commission/Decommission Confirmed / unconfirmed by device History by meter • TOU Pricing Configuration Pending Download • Emergency Management Confirmed / unconfirmed by device Overridden by user • Messaging Confirmed by device Unacknowledged by user Pending cancellation • Meter Event/Alarm/Outage Reporting Functions	

	GIS Support Function • Includes creation of .shp files to facilitate GIS import and display of the AMI network, meters, alarms, and outage data. Tropos Control's wide array of standard reports allows the operator to: • Automatically tracks key network, mesh, and backhaul performance thresholds to provide managers with clear notification of optimization opportunities • Offers access to detailed per-router performance data in manageable increments, such as hourly, daily, and weekly time periods • Provides granular detail on client link and connection history, providing current and historical context for performance optimization • Provides insight into performance levels from client devices, enabling managers to determine optimization strategies to ensure subscriber satisfaction Report information can be exported to a manager of managers via Tropos Control's northbound interface.	
6.3.7.2	This requirement is deleted. Same as Requirement 6.3.7.1	FR
6.3.7.3	Provide SVP with ad-hoc reports as needed. EA_MS supports this requirement by providing the ability to send meter read data and network performance data to other applications for analysis.	FR
6.3.7.4	Allow SVP to configure the report recipients by defined user type and send the system generated reports to predetermined email addresses and predetermined storage file locations.	FR
6.3.7.5	Allow SVP to set up or change the report deliveries without modifying source program code and without any proprietary language skills.	FR
6.3.7.6	Allow reports to be generated on demand and/or via a scheduled process.	FR
6.3.7.7	Provide SVP operating personnel with performance and health reports on demand or via a scheduled process.	FR
6.3.7.8	All reporting data shall be contained in an XML schema, which could be imported into a reporting system application.	FR
6.3.7.9	Conduct analysis to identify assets, service points, and applications that have chronic or excessive problems, report them, and support problem resolution efforts to address problems.	FR

6.3.8 System Administration, User Authorization and Authentication

Supplier shall provide System Administration, User Authorization and Authentication that meet the following requirements:

6.3.8.1	The system shall support secure access and authentication and permission-based functionality for internal and external users and Application Programming Interfaces (API)s.	FR
6.3.8.2	The system shall support system administration for establishing user access privileges, preferably via the use of the SVP Active Directory by the System Administrator.	FR
6.3.8.3	The system shall log system access and database transactions for all actions throughout the system.	FR
6.3.8.4	The system shall support capturing username, timestamp, success/failure of transaction, source IP address, and transaction description as part of the security log attribute.	FR
6.3.8.5	The system shall not allow administrative or super user access over the Internet.	FR
6.3.8.6	Provide user friendly tools for system administration function.	FR
6.3.8.7	The system administration process shall be implemented as described below: EA_MS system administration includes the following tasks; • Create User IDs - After EA_MS installation, the administrator must create the user ID that will be logged onto the server during regular use. The EA_MS User ID can be any unique name (for example, acs). Elster recommends an alphanumeric ID so that as additional communications servers are added to your system, you will have the flexibility to sequentially name the machines and user IDs. • Configuring time synchronization - It is very important to keep the clock on the EA_MS server synchronized to a standard reference time because EA_MS manages all meter time synchronization with the EA_MS server time • Configuring alarm notifications • Configuring email notifications To ensure that Tropos GridCom network configuration changes and code updates are performed to keep routers in sync and avoid mismatched configurations, Tropos Control features built-in checks, smart retries, and knowledge of the mesh topology to make upgrades and reconfigurations of thousands of routers as easy as managing a single local device. Tropos Control supports:	FR

	• Automated updates of large networks consisting of thousands of routers • Intelligent, sequenced, mesh-optimized provisioning ensures that device connectivity is maintained One of the key advantages of Tropos Control and the Tropos GridCom Architecture is the ease with which initial network deployments, expansions, and reconfigurations can take place. Through use of advanced auto-discovery, routers are able to automatically find one another to create the network mesh, reducing the need for extensive pre-planning, and streamlining network deployment. During the network roll-out, Tropos Control continuously analyzes the network and automatically determines strategies for optimizing performance, including: • Sophisticated network self-configuration capabilities • Provisioning of network routers is streamlined by using pre-configured or customized images and applying them to the targeted devices Individual routers can be specifically identified and profiles customized on an as-needed basis	

6.3.9 Information Protection and Encryption

Supplier shall provide Information Protection and Encryption that meet the following requirements:

6.3.9.1	This requirement is deleted.	FR
6.3.9.2	This requirement is deleted.	FR
6.3.9.3	Support secure connections over a Virtual Private Network (VPN).	FR

6.3.10 System User Web Browser Application

Supplier shall provide System User Web Browser Application that meet the following requirements:

6.3.10.1	Provide web browser user interface application for authorized and authenticated utility personnel.	FR
6.3.10.2	Support a session logout that will terminate the user session with a configurable session timeout value.	FR
6.3.10.3	HES' GUI shall terminate when the browse session has timed out. For the Tropos GridCom network, browser close terminates the user session and forces re-authentication before accessing the mesh router GUI or Tropos Control GUI.	FR
6.3.10.4	Support encryption and random generation of the session ID.	FR
6.3.10.5	HES shall allow multiple sessions for the same user from the same machine	FR
6.3.10.6	This requirement is deleted.	FR

6.3.11 System Integration

Supplier shall provide System Integration that meet the following requirements:

6.3.11.1	This requirement is deleted.	FR
6.3.11.2	This requirement is deleted.	FR
6.3.11.3	This requirement is deleted.	FR
6.3.11.4	This requirement is deleted.	FR

6.3.12 MDMS Interface

Supplier shall provide MDMS Interface that meet the following requirements:

6.3.12.1	HES shall support time stamping interface for data exchanges to one msec (e,g, 2010-09-20T18:20:23.424Z) based on web services standards such as CIM {IEC 61968-9}and MultiSpeak for payload information.	PR
6.3.12.2	This requirement is deleted.	FR
6.3.12.3	Provide interface development tools as described below: EA_MS provides an XSD for the AMRDEF meter data schema as well as WSDLs for all web service calls.	FR
6.3.12.4	Receive and process meter read schedules from MDMS and confirm request. Elster's HES shall support a web service interface that specifically allows external systems, such as MDM and CIS, to develop the logical connector/adapter to issue the correct calls and work flow to the HES to accomplish the desired objective. Elster's web service interfaces are published to allow enterprise providers to execute the necessary integration effort. Elster also provides basic support on the proper use of the web service interfaces. This basic support is limited to the logical interface itself. Consultation on business work flow and scoping of the overall integration effort is also available but has not been included in the existing Elster offering	FR
6.3.13.5	Receive and process on-demand meter read requests from MDMS and confirm request. Elster's HES shall support a web service interface that specifically allows external systems, such as MDM and CIS, to develop the logical connector/adapter to issue the correct calls and work flow to the HES to accomplish the desired objective. Elster's web service interfaces are published to allow enterprise providers to execute the necessary integration effort. Elster also provides basic support on the proper use of the web service interfaces. This basic support is limited to the logical interface itself. Consultation on business work flow and scoping of the overall integration effort is also available but has not been included in the existing Elster offering	FR

6.3.13.6	Process and deliver and process meter reads to MDMS. Elster's HES shall support a web service interface that specifically allows external systems, such as MDM and CIS, to develop the logical connector/adapter to issue the correct calls and work flow to the HES to accomplish the desired objective. Elster's web service interfaces are published to allow enterprise providers to execute the necessary integration effort. Elster also provides basic support on the proper use of the web service interfaces. This basic support is limited to the logical interface itself. Consultation on business work flow and scoping of the overall integration effort is also available but has not been included in the existing Elster offering	FR
6.3.13.7	Receive and process non-meter read schedules from MDMS and confirm request. Elster's HES shall support a web service interface that specifically allows external systems, such as MDM and CIS, to develop the logical connector/adapter to issue the correct calls and work flow to the HES to accomplish the desired objective. Elster's web service interfaces are published to allow enterprise providers to execute the necessary integration effort. Elster also provides basic support on the proper use of the web service interfaces. This basic support is limited to the logical interface itself. Consultation on business work flow and scoping of the overall integration effort is also available but has not been included in the existing Elster offering	FR
6.3.13.8	Receive and process non-meter on-demand information requests from MDMS and confirm request. Elster's HES shall support a web service interface that specifically allows external systems, such as MDM and CIS, to develop the logical connector/adapter to issue the correct calls and work flow to the HES to accomplish the desired objective. Elster's web service interfaces are published to allow enterprise providers to execute the necessary integration effort. Elster also provides basic support on the proper use of the web service interfaces. This basic support is limited to the logical interface itself. Consultation on business work flow and scoping of the overall integration effort is also available but has not been included in the existing Elster offering	FR
6.3.13.9	Deliver non-meter values to MDMS. Elster's HES shall support a web service interface that specifically allows external systems, such as MDM and CIS, to develop the logical connector/adapter to issue the correct calls and work flow to the HES to accomplish the desired objective. Elster's web service interfaces are published to allow enterprise providers to execute the necessary integration effort. Elster also provides basic support on the proper use of the web service interfaces. This basic support is limited to the logical interface itself. Consultation on business work flow and scoping of the overall integration effort is also available but has not been included in the existing Elster offering	FR
6.3.13.10	Deliver meter event and alarms to MDMS. Elster's HES shall support a web service interface that specifically allows external systems, such as MDM and CIS, to develop the logical connector/adapter to issue the correct calls and work flow to the HES to accomplish the desired objective. Elster's web service interfaces are published to allow enterprise providers to execute the necessary integration effort. Elster also provides basic support on the proper use of the web service interfaces. This basic support is limited to	FR

	the logical interface itself. Consultation on business work flow and scoping of the overall integration effort is also available but has not been included in the existing Elster offering	
6.3.13.11	Deliver non-meter event and alarms to MDMS. Elster's HES shall support a web service interface that specifically allows external systems, such as MDM and CIS, to develop the logical connector/adapter to issue the correct calls and work flow to the HES to accomplish the desired objective. Elster's web service interfaces are published to allow enterprise providers to execute the necessary integration effort. Elster also provides basic support on the proper use of the web service interfaces. This basic support is limited to the logical interface itself. Consultation on business work flow and scoping of the overall integration effort is also available but has not been included in the existing Elster offering	FR
6.3.13.12	Deliver events and alarms to MDMS AMI Head-End System and FAN. Elster's HES shall support a web service interface that specifically allows external systems, such as MDM and CIS, to develop the logical connector/adapter to issue the correct calls and work flow to the HES to accomplish the desired objective. Elster's web service interfaces are published to allow enterprise providers to execute the necessary integration effort. Elster also provides basic support on the proper use of the web service interfaces. This basic support is limited to the logical interface itself. Consultation on business work flow and scoping of the overall integration effort is also available but has not been included in the existing Elster offering	FR
6.3.13.13	System performance must be optimized for handling real-time event and alarm data (e.g. outages, system failures, etc.). Elster's HES shall support a web service interface that specifically allows external systems, such as MDM and CIS, to develop the logical connector/adapter to issue the correct calls and work flow to the HES to accomplish the desired objective. Elster's web service interfaces are published to allow enterprise providers to execute the necessary integration effort. Elster also provides basic support on the proper use of the web service interfaces. This basic support is limited to the logical interface itself. Consultation on business work flow and scoping of the overall integration effort is also available but has not been included in the existing Elster offering	FR
6.3.13.14	Interface must handle data communication traffic within one (1) minute for on-demand requests and five (5) minutes for scheduled meter read and system maintenance requests. Elster's HES shall support a web service interface that specifically allows external systems, such as MDM and CIS, to develop the logical connector/adapter to issue the correct calls and work flow to the HES to accomplish the desired objective. Elster's web service interfaces are published to allow enterprise providers to execute the necessary integration effort. Elster also provides basic support on the proper use of the web service interfaces. This basic support is limited to the logical interface itself. Consultation on business work flow and scoping of the overall integration effort is also available but has not been included in the existing Elster offering	PR

6.4 OPTIONAL/FUTURE TECHNICAL REQUIREMENTS

6.4.0 Recommended Practices

Supplier shall support Recommended Practices that meet the following requirements:

6.4.0.1	Provide the future capability to support Service Oriented Architecture (SOA)/Enterprise Service Bus for all system integration points.	FR

6.4.1 Other Interfaces Items

Supplier shall provide Recommended Practices that meet the following requirements:

6.4.1.1	The commercial integration interfaces for Elster EA_MS that are available for integration with other enterprise IT systems is described as follows: EA_MS includes a SOAP-compliant XML-based protocol that provides a clear and easy to use interface with MAS. This feature allows using standard tools available in different frameworks such as .NET, Java Axis, TIBCO etc. to perform tasks such as the following: • provisioning of meters • reading meters • demand reset • outage detection There are additional web services that are installed with MAS: MAS, MASAsyncReceiver, OD and OA. • MAS – Elster's proprietary MultiSpeak compliant interface that accesses most of our web services functionality • MASAsyncReceiver – A sample implementation of an interface that a customer would implement to process asynchronous messages from MAS. MultiSpeak Web Services: • OD – Elster's MultiSpeak compliant interface that accesses MAS outage detection functionality. • OA – A sample implementation that can be enabled for outage analysis troubleshooting purposes. MR – Elster's MultiSpeak compliant interface for the Meter Reading interface. The lone method supported at this time is GetAMRSupportedMeters	FR
6.4.1.2	This requirement is deleted.	

EXHIBIT I

Tropos Standard Technical SW Support Agreement

This is the basic level of support service recommended for all Tropos-based network operations. Inquiries can be communicated via phone or email. Tropos is ready to provide hands-on assistance by remotely accessing customers' networks to assist with installation of software updates or troubleshooting, as needed. This provides customers with hands-on guidance on configurations and problem solving, and it includes:

- Unlimited inquiry support: available Monday – Friday, 8am – 6pm PST, with exception of Tropos holidays available by Phone and Email
- Access to Tropos customer support website 24 x 7; including: Software updates (maintenance and minor feature enhancements) for all Tropos software including Tropos OS, and Tropos analysis and control products; Product documentation; and FAQs
- Troubleshooting support per SLA (see Problem Severity Definitions and Response Requirements) including remote login to customer networks for assistance. Available business days Monday – Friday, 8am-6pm PST
- Remote network software update support available business days Monday – Friday, 8am-6pm PST
- Remote diagnostics – enables Tropos Customer Support to remotely speed diagnosis of problems. (Requires installation of Tropos Control and remote access for Tropos Customer Support)

SOFTWARE LICENSE AND PRODUCT WARRANTY AGREEMENT

Please read the terms of this license agreement between Tropos Networks, Inc. ("Tropos") and you ("License" or "Agreement") carefully before you open the package because, by opening the sealed package, you are agreeing to be bound by the terms and conditions of this Agreement. If you are not willing to be bound by these terms and conditions, you should return the product promptly, including the packaging, the unopened package, any accompanying hardware, and all written materials, to the place of purchase for a full refund.

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   (d) You may not alter or remove any copyright, trade secret, patent, trademark, tradename, logo, product designation or other proprietary and/or other legal notices contained in or on the Software and any Documentation.

4. **Hardware and Software Warranties.**
   (a) Hardware Warranty. Tropos warrants that, for a period of one (1) year from the date of shipment (the "Warranty Period") of the hardware, tangible products, circuit boards, components and equipment provided by Tropos (the "Hardware"), the Hardware sold hereunder will be free from material defects in materials and workmanship and will conform to Tropos' published specifications in effect as of the date of manufacture.

Tropos SPECIFICALLY DISCLAIMS ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES (INCLUDING LOST PROFITS) WHICH MAY RESULT FROM THE USE OF PRODUCTS PURCHASED HEREUNDER. This limited warranty extends only to you as original purchaser unless otherwise agreed upon in writing by Tropos.

(b) The foregoing warranty shall not apply if the defective Hardware (i) has been subjected to abuse, misuse, neglect, negligence, accident, improper testing, improper installation, improper storage, improper handling or use contrary to any instructions issued by Tropos, (ii) has been repaired or altered by persons other than Tropos, (iii) has not been installed, operated, repaired and maintained in accordance with the Documentation (iv) has failed due an Act of God, including but not limited to fire, flood, tornado, earthquake, hurricane or lightning or (v) has been used with any third party software or hardware which has not been previously approved in writing by Tropos. In addition, the foregoing warranty shall not apply to Hardware (i) marked or identified as "sample," (ii) loaned or provided to you at no cost, or (iii) which are sold "as is."

(c) If during the Warranty Period: (i) Tropos is notified promptly in writing upon discovery of any defect in the Hardware, including a detailed description of such alleged defect, (ii) such Hardware is returned, transportation charges prepaid, to Tropos' designated manufacturing facility in accordance with Tropos' then-current return procedures, as set forth by Tropos from time to time, and (iii) Tropos' inspections and tests determine that the Hardware is indeed defective and the Hardware has not been subjected to any of the conditions set forth in Section 4(b) above, then, as your sole remedy and Tropos' sole obligation under the foregoing warranty, Tropos will, at Tropos' option, repair or replace without charge the defective Hardware. Any Hardware that has either been repaired or replaced under this warranty shall have warranty coverage for the longer of ninety (90) days or the remaining warranty period. Replacement parts used in the repair of Hardware may be new or equivalent to new.

(d) Software Warranty. Tropos warrants that the Software will substantially conform to its published specifications for a period of ninety (90) days from the date of shipment of the Hardware from Tropos. Your sole remedy and Tropos' sole obligation under the foregoing warranty shall be for Tropos to use commercially reasonable efforts to correct any substantial nonconformity of the Software reported in writing by you during the warranty period. The foregoing warranty shall not apply to any defect in the Software that is caused by (i) the use or operation of the Software in an environment other than that intended or recommended by Tropos, (ii) modifications to the Software not made or authorized by Tropos, (iii) third party hardware or software, whether provided by Tropos or any third party or (iv) your failure to implement all software patches, updates or releases provided in connection with this Agreement. In addition, the foregoing warranty shall not apply to any Software which has been used with any third party hardware or software.

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YOU ACKNOWLEDGE THAT YOU HAVE READ THE TERMS OF THIS LICENSE AND AGREE TO BE BOUND BY ITS TERMS UPON INITIAL USE OF THE PRODUCT

Problem Severity Definitions

Severity Level	Severity Description
Severity 1 (S1)	Problem causes a complete loss of service in the production environment; no known workaround exists; work cannot reasonably continue and work is halted. Tropos and client will commit all necessary resources around the clock to resolve the situation.
Severity 2 (S2)	Operation of an existing network is severely degraded, or significant aspects of client business operations are negatively affected by inadequate performance of Tropos products. Tropos and client will commit all necessary resources during normal business hours to resolve the situation.
Severity 3 (S3)	Operational performance of the network is impaired while most business operations remain functional. Tropos and client will commit the required resources during normal business hours to resolve the situation.
Feature Request	Enhancement request for a new functionality or requests for additional existing products or services.

Response Requirements

Severity Level	VENDOR Response Requirements	Joint Action Plan	Status Updates	Interim Fix Target *	Resolution Target *	Level of Effort
1	Within 1 hr	Within 4 hrs	Per Action Plan -no less than daily	Within 24 hours, fix problem or provide workaround. Work to downgrade to Severity2	Within 24 hours, fix problem or provide workaround. Work to downgrade to Severity2	7 by 24 effort until Interim Fix
2	Within 2 hr M-F 8-5, otherwise next business day.	Within 1 business day	Per Action Plan - no less than twice per week	N/A	Provide a solution/fix within 20 days	As agreed to in Action Plan or a minimum of M-F 8-5 continuous effort
3	Within 3 business days	within 15 business days	Per Action Plan - no less than once per week	N/A	Within 30 days, provide a solution or a statement regarding the disposition of the problem.	As agreed to in Action Plan
Feature Request	Review and provide Engineering Response within 30 days	Coordinate and escalate as required following Engineering Response	N/A	N/A	Within 30 days of Engineering Response, publish disposition of request (withdrawal or schedule)	8 X 5

* Time frames defined are desired goals on average and are initiated upon receipt of the escalation

CITY OF SANTA CLARA

AGENDA MATERIAL ROUTE SHEET

Council Date: December 7, 2010

SUBJECT: Approval of an EnergyAxis Management System Contract with Elster Solutions, LLC. For the Purchase and Implementation of an Advanced Metering and Utility Communications Infrastructure

PUBLICATION REQUIRED:

The attached Notice/Resolution/Ordinance is to be published ____ time(s) at least ____ days before the scheduled meeting/public hearing/bid opening/etc., which is scheduled for _____, 2010

AUTHORITY SOURCE FOR PUBLICATION REQUIREMENT:

Federal Codes:
Title _____ *U.S.C. §* _____
(Titles run 1 through 50)

California Codes:
Code _____ *§* _____
(i.e., Government, Street and Highway, Public Resources)

Federal Regulations:
Title _____ *C.F.R. §* _____
(Titles run 1 through 50)

California Regulations:
Title _____ *California Code of Regulations §* _____
(Titles run 1 through 28)

City
City Charter § _____ *(i.e., 1310. Public Works Contracts. Notice published at least once at least ten days before bid opening)*
City Code § _____

1. As to City Functions, by _____
Department Head

2. As to Legality, by Lindsay Beavers
City Attorney's Office / CAO Assignment No 10.1277

3. As to Environmental Impact Requirements, by _____
Director of Planning and Inspection

4. As to Substance, by Jennifer Sparacino
City Manager