All interested parties had the opportunity to submit questions in writing by email to Tad Carlson by 3:00 pm on September 29, 2022. The answers to the received questions are provided below and posted to the City’s website at www.TacomaPurchasing.org: Navigate to Current Contracting Opportunities / Services, and then click Questions and Answers for this Specification. This information IS NOT considered an addendum. Respondents should consider this information when submitting their proposals.

**Question 1:** Regarding section 5.4 and the 21 emerging capabilities (pages 9-10 in the RFP): Does TPU have metrics/criteria (e.g., ROI, benefit/cost, reliability metrics, etc.) to prioritize/select priorities among these 21 (and other) capabilities?

**Answer 1:** TPU will looks to the selected grid modernization trusted advisor to help inform prioritization criteria and metrics.

**Question 2:** The RFP references the Utility Modernization Strategy Plan (UMSP) that was published in 2019. Can you make that plan and any updates to that plan available?

**Answer 2:** See TPU Grid Modernization Document on pages 3-42 of this QA document.

**Question 3:** Can Tacoma Power’s GMSC provide an example high-level business processes map?

**Answer 3:** See Business Process Modelling Document on pages 43-71 of this QA document.

**Question 4:** Section 4 “Desired Qualifications” appears to address only a subset of the twenty plus capability areas that have been identified by Tacoma Power. Do you expect the Grid Mod trusted advisor to focus mostly on those items listed in the desired qualifications or on the broader list of capabilities?

**Answer 4:** TPU seeks to engage a trusted advisor with broad/deep experience in grid modernization efforts having experience with the capability areas listed in the RFP.
Question 5: What level of involvement and/or collaboration do you expect the GM trusted advisor will have with Tacoma Power's ADMS trusted advisor?

Answer 5: The grid modernization trusted advisor does not need to collaborate directly with the ADMS trusted advisor, but should be prepared to incorporate ADMS project timelines into the grid modernization roadmap and plan.

Question 6: Will the GM trusted advisor be restricted from bidding on any or all parts of any project implementations that arise later from this effort?

Answer 6: No
Utility Modernization

Strategic Plan & Roadmap
Vision

Integrate technology and foster innovation to deliver affordable, flexible, secure, resilient, and sustainable power and water services for our customers...
Utility industry technologies

- Advanced meters
- Data analytics
- Distribution automation
- Customer portal
- GIS
- Cybersecurity
- Blockchain
- Machine learning
- Digital twin
Utility industry innovation

Cleantech research

Regional collaboration

Prototyping

Identify local talent

Economic development

Value creation

Engineers
Scientists
Policymakers
Researchers
Students

W
TACOMA

Tacoma
Utility modernization benefits

Affordability

Flexibility

Security

Resiliency

Sustainability
Enabling TPU’s objectives

Equitable customer service

Environmental stewardship

Economic development

Reliability & resiliency
Utility Modernization Examples
FIGURE 25
How innovative is your utility when building out infrastructure? (Select one choice)

Source: Black & Veatch

- Very Innovative: 15.3%
- Innovative: 48.2%
- Neutral: 22.4%
- Slightly Innovative: 9.4%
- Not Innovative At All: 4.7%
The state of utility modernization

<table>
<thead>
<tr>
<th>Category</th>
<th>Implemented or in progress</th>
<th>Next five years</th>
<th>Next 10 years</th>
<th>No plans</th>
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</thead>
<tbody>
<tr>
<td>Cybersecurity</td>
<td>80%</td>
<td>11%</td>
<td>7%</td>
<td>2%</td>
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<tr>
<td>Advanced meters</td>
<td>80%</td>
<td>11%</td>
<td>6%</td>
<td>3%</td>
</tr>
<tr>
<td>Outage management</td>
<td>70%</td>
<td>24%</td>
<td>5%</td>
<td>1%</td>
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<tr>
<td>Conservation programs</td>
<td>66%</td>
<td>18%</td>
<td>12%</td>
<td>4%</td>
</tr>
<tr>
<td>Customer engagement</td>
<td>65%</td>
<td>23%</td>
<td>9%</td>
<td>3%</td>
</tr>
<tr>
<td>Distribution automation</td>
<td>62%</td>
<td>24%</td>
<td>12%</td>
<td>2%</td>
</tr>
<tr>
<td>Mobile work management</td>
<td>51%</td>
<td>33%</td>
<td>11%</td>
<td>5%</td>
</tr>
<tr>
<td>Demand response</td>
<td>41%</td>
<td>33%</td>
<td>16%</td>
<td>10%</td>
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<tr>
<td>Electrification</td>
<td>38%</td>
<td>33%</td>
<td>16%</td>
<td>13%</td>
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<tr>
<td>Innovation center</td>
<td>28%</td>
<td>28%</td>
<td>32%</td>
<td>12%</td>
</tr>
<tr>
<td>Energy storage</td>
<td>26%</td>
<td>31%</td>
<td>25%</td>
<td>18%</td>
</tr>
<tr>
<td>Grid sensors</td>
<td>16%</td>
<td>32%</td>
<td>26%</td>
<td>26%</td>
</tr>
</tbody>
</table>
SMUD®
Sacramento Municipal Utility District

Control your thermostat on the go
Angela's Nest thermostat is convenient to use and helps her family save energy.

Brightening our region

Crystal Basin
Scholarship
Four step process for advanced leak detection:
1) Automated phone call providing initial leak notification
2) Follow up letter notifying the customer the leak is still happening
3) Physical property visit
4) Personal phone call attempting final contact before the next billing cycle

“Instead of being reactive to customer inquiries, the AMI smart water technology allows us to alert them proactively—before they receive a higher bill.”
Utility Industry Disruptive Forces
Ever-increasing customer expectations

- **Immediacy**
  - Twitter

- **Convenience**
  - Amazon

- **Simplicity**
  - Apple

- **Self-service ability**
  - Google

- **Familiarity**
  - Facebook

- **Creativity**
  - YouTube
New market opportunities
Integration of renewables onto the grid
Market shifts
Aging infrastructure
An evolving workforce
Rising cybersecurity threats

[Images of power lines, a water treatment plant, a map of the United States, and an industrial facility.]
Natural disasters & extreme weather
Recommended Utility Modernization Initiatives
Initiatives in progress thru 2022

Equitable Access for All Customers
- mytpu.org redesign
- Enhanced customer portal
- Customer analytics use cases
- Enhanced customer outage notifications
- Digital signage at TPU campus

Protect & Steward the Environment
- Natural resources analytics
- ESRI GIS modernization
- Asset management analytics use cases
- Enhanced load forecasting
- Enhanced customer load profiling

Economic & Workforce Development
- Workforce Connect
- Workforce analytics use cases
- CRM for commercial/industrial customers
- Office 365 & Microsoft Teams
- Smart City use cases

Resilience & Reliability
- Advanced metering infrastructure
- Security & network operations center
- Cybersecurity program refinements
- Energy Imbalance Market
- Distribution automation
Empowering TPU customers thru advanced meters

Advanced meters

TPU meter data mgmt. system

My Usage

August 28 - September 27

- Total Bill: $45.00
- Total Consumed: 100 kWh

Set Alert

This Week

- Tuesday: $5.00, 5 kWh
Advanced meters benefit TPU customers

Value my time
- Improved outage/restoration times
- Water leak detection capabilities
- Remote turn-on/turn-off
- Advanced self-service capabilities

Value my money
- Automated billing
- Monthly billing
- Prepayment options
- Selectable bill date

Value me
- Lower cost of service model
- Reduction of manual processes
- Paperless billing capabilities
- Demand response capabilities
- Two-way communications

Value my preferences
- Near real-time usage information
- Alerts and notifications
- Billing and payment notifications
- Conservation options
- Multi-channel capabilities
Digital customer engagement

### Paperless Bill
Sign up and go paperless! Rather than receiving a bill in the mail, Citizens will send you an alert of your preference each month when your bill is ready to be viewed.

### Contacts

- **Text**
- **Text**
- **Text**

### Payment Posting

- **On**

### Payment Arrangement

- **On**

### Disconnect

- **On**

### Service Notifications

- **Add Contact**
Deliver a single TPU brand experience

Deliver a consistent TPU customer experience that accounts for our overlapping customer base, service offerings, and choice of channels our customers prefer to use.
Data-driven decision making

Cushman Fisheries | Data Overview

<table>
<thead>
<tr>
<th>SPECIES_NAME</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
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</thead>
<tbody>
<tr>
<td>Unmarked Orphan</td>
<td>130</td>
<td>1</td>
<td>8.536</td>
<td>2.681</td>
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<tr>
<td>Coho</td>
<td>1.539</td>
<td>604</td>
<td>5.723</td>
<td>7.954</td>
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<tr>
<td>Bull Trout</td>
<td>1</td>
<td>5.723</td>
<td>4</td>
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<tr>
<td>Chinook</td>
<td>1.539</td>
<td>1</td>
<td></td>
<td></td>
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<tr>
<td>Coho</td>
<td>1.539</td>
<td>1</td>
<td></td>
<td></td>
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<tr>
<td>Cutthroat Trout</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Data-driven decision making

Cushman Fisheries | Length & Weight

Median Length & Weight | All-Time

<table>
<thead>
<tr>
<th>Species</th>
<th>Median Length</th>
<th>Median Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coho</td>
<td>127 MM</td>
<td>23 G</td>
</tr>
<tr>
<td>Sockeye</td>
<td>146 MM</td>
<td>28 G</td>
</tr>
</tbody>
</table>

Length & Weight by Species

![Graph showing length and weight by species](image)
Fish acoustic telemetry at Cushman
Water quality analytics

Water Quality Test Results

What’s the distribution of water tests by result?

<table>
<thead>
<tr>
<th>Below Reporting Levels</th>
<th>Exceeds MCL</th>
</tr>
</thead>
<tbody>
<tr>
<td>87,877</td>
<td>47</td>
</tr>
</tbody>
</table>

What analytes tested at or above state reporting levels?

<table>
<thead>
<tr>
<th>Analyte</th>
<th>Exceeds SRL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manganese</td>
<td>420</td>
</tr>
<tr>
<td>Iron</td>
<td>365</td>
</tr>
<tr>
<td>Conductivity</td>
<td>334</td>
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<tr>
<td>Sodium</td>
<td>269</td>
</tr>
<tr>
<td>Calcium</td>
<td>152</td>
</tr>
<tr>
<td>Nitrate</td>
<td>146</td>
</tr>
<tr>
<td>Total Susp Zh Ph</td>
<td>144</td>
</tr>
<tr>
<td>Iron</td>
<td>128</td>
</tr>
<tr>
<td>Nitrate</td>
<td>122</td>
</tr>
<tr>
<td>Chlorine</td>
<td>121</td>
</tr>
<tr>
<td>Iron</td>
<td>80</td>
</tr>
<tr>
<td>Total Susp Zh Ph</td>
<td>27</td>
</tr>
</tbody>
</table>

What are the maximum results for CONDUCTIVITY over time?

<table>
<thead>
<tr>
<th>Sample Result</th>
<th>MCL</th>
<th>MAX</th>
</tr>
</thead>
<tbody>
<tr>
<td>3,000</td>
<td>1,000</td>
<td>1,000</td>
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</tbody>
</table>
Improve resiliency thru cybersecurity program maturity

- Governance
- Vulnerability Management
- NERC CIP Compliance
- Security Ops. Center
- Managed Cybersecurity Services
- Control Systems Security
- Data Protection
- Identity & Access Mgmt.
Unmanned aircraft systems for utility operations
Future initiatives

- Distribution automation
- EIM & market integration
- GIS connectivity model
- Machine learning
- Digital twin capability
- Blockchain
<table>
<thead>
<tr>
<th>Utility Modernization Topic</th>
<th>PUB Evening Session Timeframe</th>
<th>Presenting Departments / Sections</th>
</tr>
</thead>
<tbody>
<tr>
<td>Utility Modernization Strategy &amp; Roadmap</td>
<td>May 22</td>
<td>Andrew Braeger, Andre Pedeferri, Joe Tellez</td>
</tr>
<tr>
<td>Remote Connect &amp; Disconnect</td>
<td>June 12 or 26</td>
<td>JD Smith, Power T&amp;D</td>
</tr>
<tr>
<td>Customer Portal Platform</td>
<td>July 10</td>
<td>AMI Program Team or Market Development</td>
</tr>
<tr>
<td>Advanced Analytics</td>
<td>July</td>
<td>UTS Data Engineering, Power Analytics, Water Analytics</td>
</tr>
<tr>
<td>Customer Payment Options</td>
<td>August</td>
<td>Customer Assistance</td>
</tr>
<tr>
<td>Demand Response</td>
<td>August</td>
<td>Power - Conservation</td>
</tr>
<tr>
<td>Distribution Automation</td>
<td>September</td>
<td>T&amp;D – Electric Planning</td>
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<tr>
<td>Enhanced Outage Management</td>
<td>September</td>
<td>T&amp;D – Electric Operations</td>
</tr>
<tr>
<td>Smart Water</td>
<td>October</td>
<td>Water Distribution Engineering / Asset &amp; Information Management</td>
</tr>
<tr>
<td>Customer Health, Safety, &amp; Privacy</td>
<td>October</td>
<td>Community &amp; Media Services</td>
</tr>
<tr>
<td>Commercial &amp; Industrial Customers</td>
<td>November</td>
<td>Market Development – Major Accounts</td>
</tr>
<tr>
<td>Distributed Generation &amp; Renewables Integration</td>
<td>December</td>
<td>Power Management / T&amp;D Electric Planning</td>
</tr>
<tr>
<td>Energy Imbalance Market</td>
<td>December</td>
<td>Power Management</td>
</tr>
</tbody>
</table>
Utility modernization topic overview

- Topic Introduction
- Topic Definition & Examples
- Industry Trends & Practices
- Customer Benefits
- Utility Benefits
- TPU Current State & Gaps
- Alignment with TPU Modernization Plan
- Recommended Next Steps
Capabilities roadmap – utility modernization

**Equitable customer service**
- Responsive website
- Customer portal platform
- Customer preferences center
- Demand response offerings
- Monthly billing
- Customer prepay

**Economic development**
- Mobile workforce management
- Smart City use cases
- Lead & opportunity management

**Environmental stewardship**
- Natural resources analytics
- Remote meter reading
- Distributed generation
- Automated service orders
- Enhanced customer load profiling
- Enhanced load forecasting

**Reliability & resiliency**
- Security & network operations
- Water leak notifications
- Enhanced outage notifications
- Remote connect & disconnect
- Energy imbalance market integration

**Timeline**
- 2019
- 2020
- 2021
- 2022 and beyond...
Technology roadmap – utility modernization

**Equitable customer service**

- Customer portal integration
- Customer prepay integration
- Residential customer analytics use cases
- Preferences center integration
- Customer relationship management for residential customers

**Economic development**

- Workforce Connect implementation
- Commercial/industrial customer analytics use cases
- Workforce analytics use cases
- Customer relationship management for commercial & industrial customers

**Environmental stewardship**

- Natural resources analytics use cases
- ESRI GIS modernization
- Asset management analytics use cases
- Customer conservation analytics use cases

**Reliability & resiliency**

- Advanced meter program delivery
- Distribution automation
- Cybersecurity program refinements
- Machine learning analytics use cases
- Digital twin investments

2019 2020 2021 2022 and beyond...
Business Process Modelling: AMI Asset Management

30th October, 2018
1. Meter to Bill
2. Deployment
3. Connect & Disconnect
4. Event Management
5. Asset Management
6. Meter Data Operations
7. Prepayment
8. Outage Management
- Test results will go into SAP
- Warranty management will be manual (with support from SAP)
- No sample testing upon receipt of meters and modules
- Registers will become separate assets (and need to be tracked on install/remove and service orders)
- Residential water meters will always include a new register
- Always get an in and out read, even if just AMI module change
- A residential service (E&W) inspection process will be established
- What else?
Lack of coordination between Planning and meter forecasting

Who is the AMI Product Manager?

Electric meter shop procurement and installation of AMI meters prior to completion of AMI integration effort. Migration of test and other data.

Meter programs are not associated with individual meters today.

Where is the system of record for meter firmware?

Will network devices go into SAP, or only Cherwell?

Will you audit MIV warehouse for devices?

Water needs to build a more robust warranty process

SAP periodic replacement reports not used or needs update?

What else?
1. Who is the BPM owner? Assigned to: TBD. Due: TBD
2. Who is the BPM approver? Assigned to: TBD. Due: TBD
3. Validate which meter types, if any, will undergo acceptance testing upon receipt. (Requirement 3.1.7.c, Activity 420) Assigned to: TBD. Due: TBD
4. Will AMI Network devices be maintained in GIS? Where is the system of record for the network asset? (Requirement 3.1.7.f, and elsewhere throughout the BPM). Assigned to: TBD. Due: TBD
5. Will MDMS maintain visibility of non-AMI meters? (Requirement 3.1.7.q and Requirement 3.1.7.r). Assigned to: TBD. Due: TBD
6. Review and approve Business Requirements, including requirements from BP sessions: Assigned to: TBD. Due: TBD
7. Review and update Reporting Requirements. Assigned to: TBD. Due: TBD
8. Will all test data and test results go to SAP? (3.4 Data Requirements) Assigned to: TBD. Due: TBD
9. Will TPU implement an “AMI Product Manager” to shepherd new products, new features and changes? If not, who will be responsible for this role? (Activity 100) Assigned to: TBD. Due: TBD.
10. What will be the sparing policy for AMI network equipment? (Activity 210) Assigned to: TBD. Due: TBD.
11. Will Network equipment be tracked as an asset, or an assembly with field replaceable units? Assigned to: TBD. Due: TBD
12. Does TPU issue RFPs for meters? (Activity 320). Assigned to: TBD. Due: TBD.
13. Validate that Sensus receives MMF files directly and loads into RNI and TPU action is not required. (Step 440). Assigned to: TBD. Due: TBD.
14. How will meters be received into SAP when they are being physically received at the MIV warehouse? Will a TPU person be required to support this receipt to get them into SAP? (Step 510) Assigned to: TBD. Due: TBD

15. Will TPU audit the Meter Installation Vendor to validate proper accounting for the meters? (Activity 530). Assigned to: TBD. Due: TBD

16. Will Service Orders be used for network equipment? (Activity 610). Assigned to: TBD. Due: TBD

17. Will TPU need to program electric meters in the field? (Activity 620). Assigned to: TBD. Due: TBD

18. Does SAP require opening and closing reads for AMI Module exchange? (Activity 630) Assigned to: TBD. Due: BluePrint

19. Need updated processes for removing and installing meters where AMI modules are also involved. (Activity 650). Assigned to: TBD. Due: TBD.

20. Need detailed SOP for planning and expansion as additional network may be required. (Activity 631). Assigned to: TBD. Due: TBD.
21. Will Communications repair any network equipment? (Activity 726). Assigned to: TBD. Due: TBD

22. Develop detailed process for sample testing, cleaning, calibration, resetting of AMI meters, including testing of AMI communications, in the Meter Shop. (Activity 750, Activity 760) Assigned to: TBD. Due: TBD.

23. Develop detailed troubleshooting and validation processes for AMI meters and AMI modules. (Activity 730) Assigned to: TBD. Due: TBD.

24. Develop details process for repair and testing of AMI network devices (Activity 751). Assigned to: TBD. Due: TBD.

25. Document required testing and inspection for all electric and water meters and services (Activity 800). Assigned to: TBD. Due: TBD

26. Update standard processes for water meter inspections to account for AMI modules (Activity 820). Assigned to: TBD. Due: TBD.
27. Will TPU conduct residential electric service inspections? Is policy required? (Activity 830). Assigned to: TBD. Due: TBD


29. Should water and electric test results be integrated into SAP? This was a gap identified during “as is” review. Assigned to: TBD. Due: TBD.

30. Will AMI network devices be modelled/managed in SAP to support periodic maintenance? Assigned to: TBD. Due: TBD.

31. Deliver template for meter configuration modelling and tracking during BluePrint. Assigned to: JOW. Due: Blueprint.

32. How will module assets be managed in SAP? Assigned to: System Integrator. Due: BluePrint.

33. Make sure that Blue Print evaluates all multi-meter/compound meter scenarios. Assigned to: System Integrator. Due: BluePrint.
34. Deferral/OptOut meters and handling should be included in this BPM. Assigned to: JOW. Due: 12/31/18

35. Should Shipping and Test files be automatically loaded into SAP? Assigned to: AMI Asset Management Team. Due: 12/31/18

36. Will TPU audit the MIV warehouse for assets? If so, does this need to be formalized or informal? (Step 530). Assigned to: AMI Asset Management Team. Due: 12/31/2018

37. Need list of Service Orders (Step 610). Assigned to: Virginia DuPraw. Due: 11/15/2018

38. Policy/Procedure required that residential water meters will always include a new register. Assigned to: Corey Bedient. Due: BluePrint

39. Update standard process for removing AMI meters from service. Assigned to: Electric Meter Shop/Water Meter Shop. Due: TBD
40. Develop standard troubleshooting and validation process for AMI electric meters in Electric Meter Shop. Assigned to: Electric Meter Shop. Due: TBD.
41. Develop standard troubleshooting and validation process for AMI water meters and modules in Water Meter Shop. Assigned to: Water Meter Shop. Due: TBD.
42. Update standard inspection and field processes to include management of the AMI modules on water meters. Assigned to: Water Meter Shop. Due: TBD.
43. Establish residential electric service inspection policy. Assigned to: TBD. Due: Blue Print.
44. Establish residential water service inspection policy. Assigned to: TBD. Due: Blue Print.
45. Does Sensus require any notification on required TGB inspections? Assigned to: John Zwosta. Due: TBD
46. Add typical electric and water field maintenance activity numbers. Assigned to: JOW. Due: 11/15/18
Presently, Water uses a custom database for maintaining test data captured from test systems while Electric provides test data from WattNet into SAP. Test data is required to be maintained in SAP going forward.

Electric Meter shop plans to procure and deploy AMI meters once the contract is completed and prior to the completion of the configuration and integration of all the AMI systems. This will require migration of the “non-AMI meters” to be AMI meters upon go live and the post processing of data files (test and MMF files) obtained during the pre-go live period.

Water metering has requested to begin tracking water meter registers as separate assets. Management of the receipt of new meters prior to go live as well as the migration of legacy data to new configuration will need to be considered.

New process and capability is required where SAP will set warranty information on all incoming meters and modules.

Presently, when meters are received from the field into the Meter shop, the meter status is changed to unprogrammed to indicate that the meter has been cleaned, zeroed and is ready to go back to the field. Will this cause issues moving forward since every AMI meter is programmed?

For AMI Electric Meters which are measuring demand, these meters are programmed to self-read and reset daily. Consequently, the remove read will represent the demand since last midnite. SAP will need to recognize this case and request the removed demand read from the MDMS.

SAP EHP8 includes time capabilities. What impact will this have on CT/PT changes (Step 950)?
1. Warranty report: Identify devices failing under warranty and ensure that TPU is compensated for devices failing under warranty (H)

2. Failure report: Identify devices which are failing in the field by type and frequency (H)

3. Configuration report: Provide details on firmware and hardware versions (H)

4. Retire report: Provide details on meters which are retired from service by type, years in service, etc. (H)

5. SAP is the asset reporting source for electric meters

6. ESRI + SAP provides asset reporting for water meters

7. WattNet provides failure reporting for Electric meters.

8. Failure reports by type of meters and year

Anything else?
1. AMI meters, AMI modules and AMI network equipment must be supported within SAP, MDMS and AMI HES (H)

2. All programmable devices must have configurable over the air and support the upgrade of communications and metrology firmware (H)

3. All meters must be accurate within acceptable industry standards (H)

4. The location of any AMI device must be maintained in GIS (H)

5. The life cycle status of any AMI device must be tracked within SAP (H)

6. The solution must be able to plan for and acquire AMI meters and AMI network devices to support growth and maintenance (H)
7. The solution must be able to receive, validate and configure new AMI network devices (H)
   ◦ a) SAP must automatically, via file upload, receive new and repaired AMI meters and AMI modules (H)
   ◦ b) The solution must process new AMI meters and AMI modules into SAP and MDMS upon receipt (H)
   ◦ c) The solution must ensure that new AMI meters undergo acceptance testing (L) NOTE: TPU Power and Water do not perform acceptance testing on meters and will not start this as a new process
   ◦ d) The solution must create Service Orders (in Cherwell) for the installation of a new AMI network device (M)
   ◦ e) The solution must process the completed installation of an AMI network device (M)
   ◦ f) SAP, or Cherwell, or manual procedure, via AMI Operations, must synchronize the AMI HES and GIS with the installation of AMI network device (H)
   ◦ g) The solution must validate the correct operation and configuration of the new AMI device (H)
   ◦ h) SAP must be able to receive new AMI meters prior to the intended rollout of AMI meters, reflect these meters as non-AMI meters and then migrate these meters to be AMI upon implementation of Release 1 (H)
8. The solution must be able to exchange AMI meters and modules (H)
   a) The solution must create Service Orders for the exchange of an AMI meter or AMI module (H)
   b) The solution must allow the exchange of a non-AMI meter with another non-AMI meter (M)
   c) The solution must allow the exchange of an AMI meter with another AMI meter (H)
   d) The solution must allow the exchange of an AMI meter with a non-AMI meter (M)
   e) The solution must allow the exchange of a non-AMI meter with an AMI meter (M)
   f) SAP must automatically process the completed exchange of an AMI meter (H)
   g) SAP must automatically process the completed exchange of an AMI water meter with a separable AMI module (H)
   h) SAP must automatically synchronize the MDMS with the exchange of AMI meter (H)
8. The solution must be able to exchange AMI meters and modules (H)
   - i) SAP must automatically synchronize the MDMS with the exchange of an AMI water meter with a separable AMI module (H)
   - j) SAP must automatically synchronize the MDMS with the exchange of AMI module, where the meter does not change (H)
   - k) The MDMS must provision the AMI HES with the exchange of an AMI meter (H)
   - l) The MDMS must provision the AMI HES with the exchange of an AMI water meter with a separable AMI module (H)
   - m) The MDMS must provision the AMI HES with the exchange of an AMI module where the AMI meter did not change
   - n) The MDMS must validate the correct operation and configuration of the new AMI meter or AMI module (H)
   - o) SAP must automatically synchronize the MDMS with the removal of an AMI meter (H)
   - p) SAP must automatically synchronize the MDMS with the removal of an AMI water meter with a separable AMI module (H)
   - q) SAP must automatically synchronize the MDMS with the replacement of an AMI meter with a non-AMI meter (M)
   - r) SAP must automatically synchronize the MDMS with the removal of an AMI module from an AMI water meter (turning the meter into a non-AMI meter) (M)
8. The solution must be able to exchange AMI meters and modules (H)
   a) SAP must automatically synchronize the MDMS with the replacement of an AMI meter with an AMI meter or an AMI module (H)
   b) SAP must automatically synchronize the MDMS with the replacement of a non-AMI meter with an AMI meter (H)
   c) SAP must automatically synchronize the MDMS with the installation of an AMI module on a water meter (H)
   d) The MDMS must provision the AMI HES with the removal of an AMI meter and/or an AMI module (H)
   e) SAP must automatically synchronize the MDMS with the change of a CT/PT (H)
   f) SAP must be able to reverse a meter install (H)
   g) SAP must automatically synchronize the MDMS with a meter install reversal (M)
   h) The MDMS must automatically provision the AMI HES with a meter install reversal (M)
   i) SAP must be able to reverse a meter removal (H)
   j) SAP must automatically synchronize the MDMS with a meter removal reversal (M)
   k) The MDMS must automatically provision the AMI HES with a meter removal reversal (M)
   l) The solution must correctly bill from data obtained from the AMI meter (H)
   m) The solution must ensure that no meter or module removed from the field is re-installed prior to the completion of the exchange in SAP, the MDMS and the AMI HES (H)
9. The solution must allow for a device/premise to change rates (M)
   a) SAP must support a rate change (M)
   b) SAP must update the MDMS with any register or configuration change (M)
   c) The solution must correctly bill the device on the new rate (H)
10. The solution must be able to validate, reconfigure and repair removed AMI meters, AMI modules and AMI network devices (H or M)
   ◦ a) The solution must identify failed AMI meters or AMI modules (H)
   ◦ b) The solution must be able to replace failed AMI meters or AMI modules (H)
   ◦ c) The solution must identify AMI meters which fail while under warranty (M)
   ◦ d) The solution must be able to return AMI meters under warranty (M)
   ◦ e) The solution must identify failed network devices (H)
   ◦ f) The solution must be able to replace failed network devices (H)
   ◦ g) The solution must identify network devices which fail while under warranty (M)
   ◦ h) The solution must be able to return network devices under warranty (M)
11. Requirements from Business Process Review sessions
   ◦ a) The Technology Control Board will approve any new devices. (H)
   ◦ b) Vendor training for all new devices is required (H)
   ◦ c) New electric meter firmware will be analyzed by Electric Metering and new water meter firmware will be analyzed by Water Metering (H)
   ◦ d) Shipping files will be received in Ariba which will then place data into SAP (M)
   ◦ e) MMF files do not need to be received into TPU systems, other than the AMI HES (L)
   ◦ f) CTR (Certified Test Results) will be automatically loaded into SAP and WattNET (M)
   ◦ g) Single phase meters will be programmed at the factory and re-programming is not expected (H)
   ◦ h) All single phase meters should support net metering as a default program (H)
11. Requirements from Business Process Review sessions
   ◦ i) GPS location information will be captured with the AMI rollout, as well as on future new service installs (M)
   ◦ j) GPS location information should be verified during maintenance of the meter and site (M)
   ◦ k) Pictures will be captured during deployment as well as on future new service installs and during any field investigation (H)
   ◦ l) Inspections on commercial customers (Verify CTs, wiring, etc.) will continue in deployment. (H) If a meter read fails during exchange, customer service will estimate the exit meter read and associated consumption. NOTE: Will need capability in SAP to do this, or a process for an estimated read to be created in MDM. Follow up during Design Phase (H)
11. Requirements from Business Process Review sessions

- m) From the Gateway process, the diagnostics process where a meter can be remotely diagnosed prior to field investigation should be kept. Would like to see more diagnostics (H)
- n) Meter Shop will continue the process of resetting all meters when they are brought back from field. This includes temporary meters (H)
- o) CT/large meters will be inspected after installation.
- p) Sample testing in the field will be halted during the deployment phase. (L)
- q) Remote of disconnect/reconnects which do not complete should create a Service Order for a field visit and resolution (H)
- r) Any CT change requires a meter change (H)