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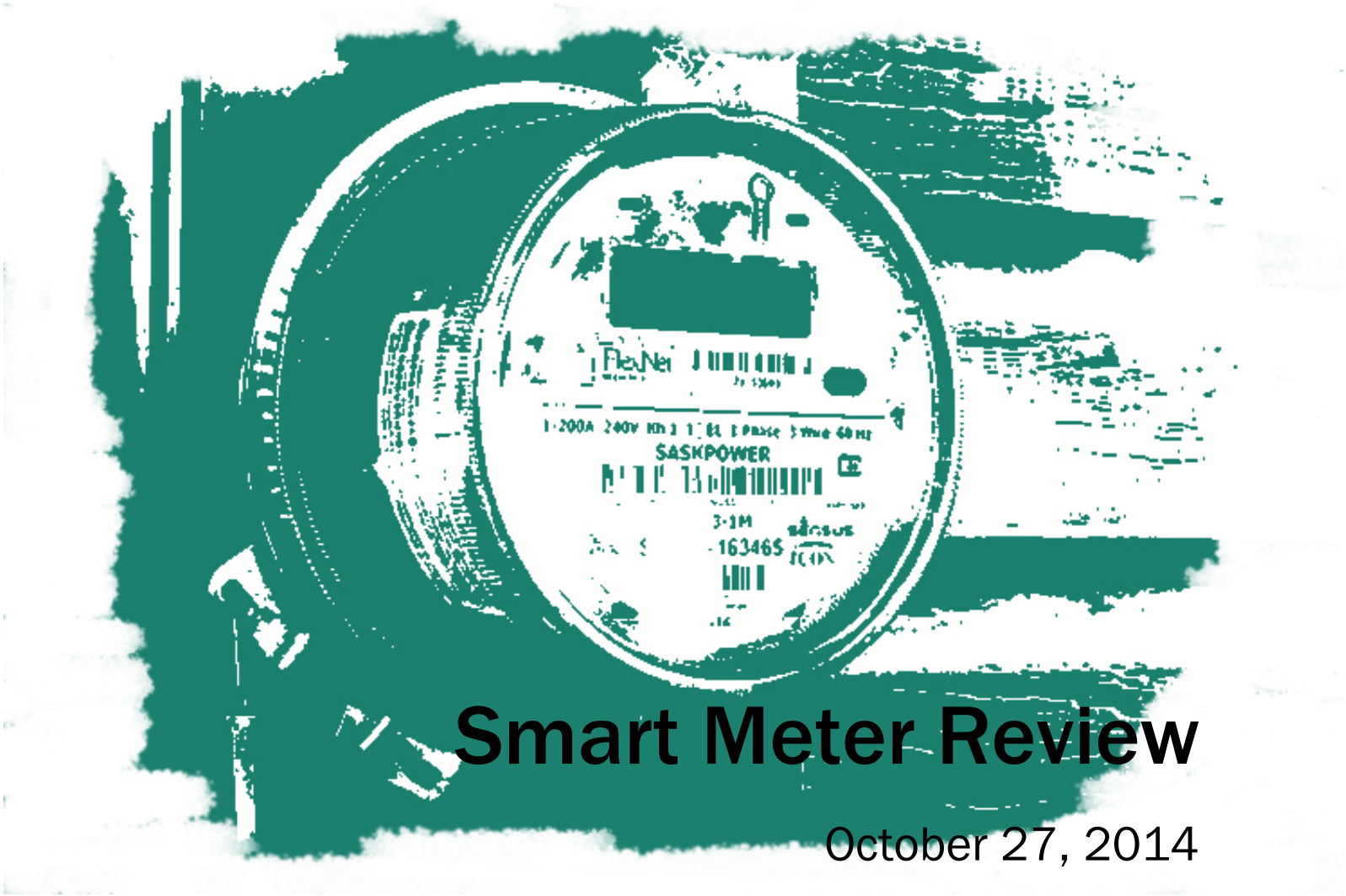


Smart Meter Review

October 27, 2014

CROWN INVESTMENTS CORPORATION OF SASKATCHEWAN

Crown Investments Corporation of Saskatchewan

CONTENTS

Introduction and Background

In August 2010, SaskPower commenced its Automated Metering Infrastructure (AMI) Program, a program designed to make use of new technology to improve the efficiency and effectiveness of metering customers' electricity usage. Between 2010 and 2011, SaskPower completed key project vendor procurements, and selected Sensus USA Inc. (Sensus) for the supply of the AMI technology, including smart meters, and Grid One Solutions Inc. (Grid One) for the installation in January 2012.

SaskPower's equipment delivery began in early 2012, as did laboratory and field testing activities. These activities continued through the fall of 2013 when full meter and module deployment commenced. A pilot project in Hanley, Saskatchewan began in the summer of 2012, where 400 smart meters were installed and tested. At the end of July 2014, close to 108,000 electric meters were installed, and 280 network sites had been commissioned.

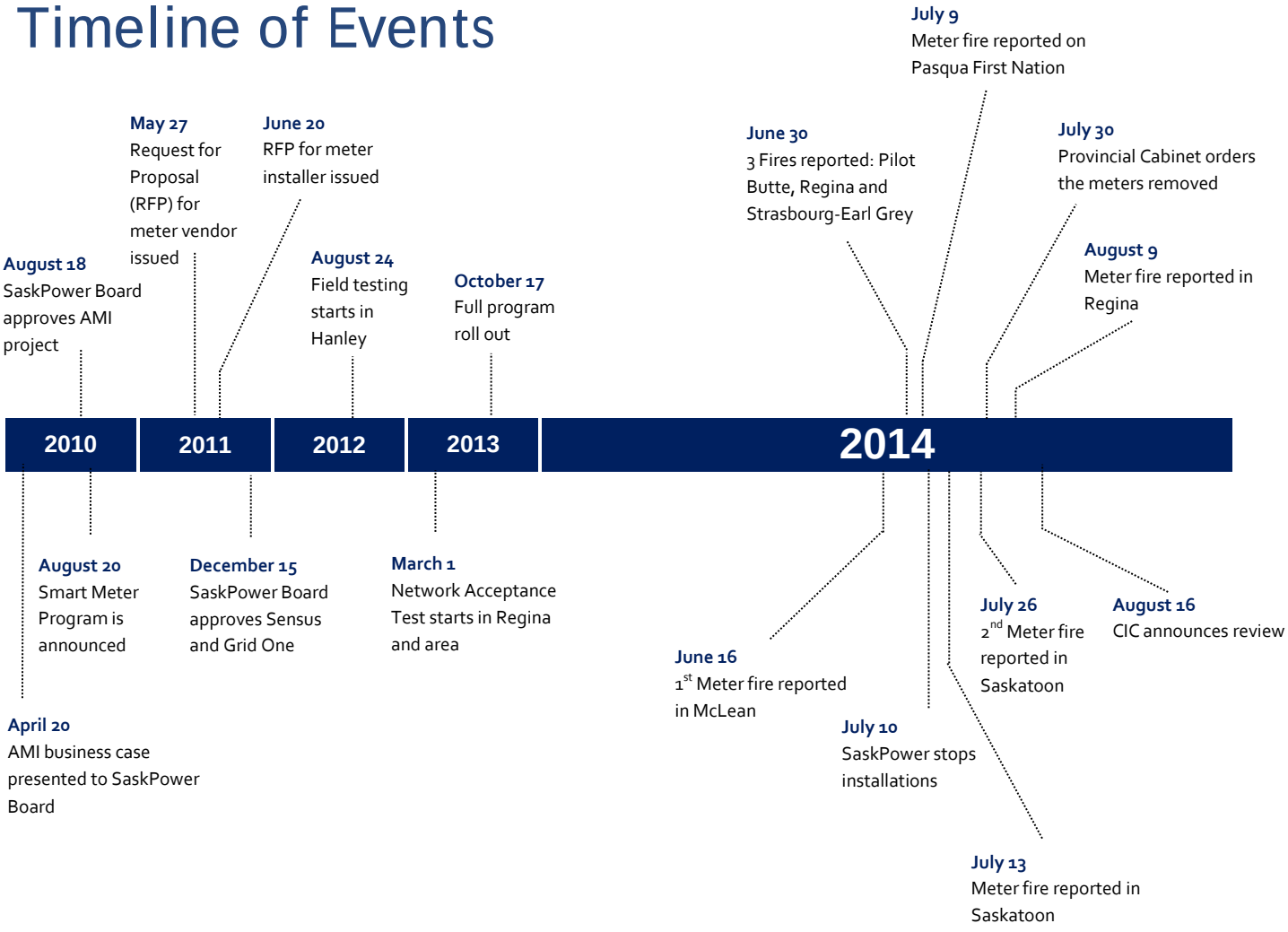
Over a period of three weeks in the summer of 2014, in various parts of the Province, eight meters failed catastrophically, melting or burning, and in some cases damaging the sides of houses.[1] These incidents were considered sufficiently serious for SaskPower to halt the installation program. Shortly thereafter, the Government of Saskatchewan (the Government) ordered the removal of all of the Sensus smart meters.

Public safety and transparency are of paramount importance to the Government. Under the direction of the Government, CIC conducted a series of independent third party reviews of SaskPower's Smart Meter Program, following the eight meter related fires. The reviews assessed the Smart Meter Program from legal, technical, and procurement perspectives as well as contract management.

The reports prepared by PricewaterhouseCoopers (PwC) and Ritenburg & Associates (Ritenburg) are attached. The report prepared by CIC's independent legal experts, Robertson Stromberg LLP, will not be released in order to protect SaskPower's legal privilege in the event that future litigation is considered. However, a summary report of the legal review has been included.

[1] A catastrophic failure has been defined by the consultants and industry as a meter which has burnt, melted, blackened, caught fire, arced, sparked or exploded/blown from the premise.

Timeline of Events



Advanced Metering Infrastructure (AMI)

Smart meters are widely used across North America and many parts of the world. They represent a generational shift in metering technology as power companies move to a more automated system that provides the operators with much more information on the performance of the power grid.

The shift to smart meters also represents a huge infrastructure renewal challenge. SaskPower's AMI Program consists of the replacement of SaskPower's existing electric meters with an AMI electric meter (smart meter) with a two-way AMI communication module, installed at a customer's home, farm or business.

AMI also includes a provincial communication network to deliver information from the smart meters to SaskPower, where it will be integrated into corporate systems for customer billing and other operational purposes. The key customer benefit associated with smart meters is that they record actual power usage details, so bills are based on actual electricity used, rather than estimates. Meter readings can be done remotely, eliminating the cost of manual readings.

This is accomplished through a wireless communications system, which takes measurements throughout the day. The data is transmitted over a secure network to a central data management system. This capacity allows the meters to detect power outages, meaning customers no longer have to call in to SaskPower when there is an outage. This remote communications ability also allows for a quicker transfer process for customers who move. Despite problems with a specific model of meter, smart meter technology is, in the long run, the best option for improving and expanding electrical infrastructure in the province.

Scope of Review

The scope of the Review included:

1. SaskPower's due diligence exercised in the selection of the supplier of smart meters, including, but not limited to:
    - the factors used to evaluate the suppliers, measured against good practices;
    - compliance of technology with safety and measurement regulations;
    - compliance with SaskPower's internal policies;
    - consideration of company reputation and product history; and,
    - the ongoing supplier contract management.
2. SaskPower's due diligence exercised in the selection process for the contract of installation services, including, but not limited to:
    - the process used to evaluate installation service providers;
    - review documentation; including the request to the Ministry of Labour Relations and Workplace Safety regarding the qualifications of the installers;
    - the examination of smart meter installation programs in other jurisdictions;
    - compliance with SaskPower's internal policies; and,
    - the contract management oversight of meter installation work by Grid One, to ensure the safe installation of meters.

3. Legal due diligence related to, but not limited to:

   - breach of contract, termination, and dispute resolution if performance or safety issues emerge;
   - payment terms and hold backs to protect SaskPower's financial interests in the event of problems; and,
   - SaskPower's ability to receive compensation recovery.

4. Assessment of the cause of the smart meter fires. CIC's legal consultant engaged an engineering firm on CIC's behalf.

Selection of Independent Experts

In selecting independent experts to conduct the Smart Meter Review, CIC considered a number of factors including experience and industry knowledge, level of involvement in other SaskPower projects to ensure independence, and their level of credibility to ensure public confidence. Three firms were engaged to undertake the review.

PwC is a highly regarded, international accounting and consulting firm with extensive experience in procurement engagements of utility companies and smart meters. PwC was responsible for assessing the adequacy of SaskPower's due diligence, procurement, and contract management practices related to the Smart Meter Program; and compared to good practice, identifying weaknesses in SaskPower's procurement and contracting policies and procedures. PwC was asked to identify recommendations to enhance SaskPower's policies and procedures in the execution of both procurement and contract management going forward. PwC ran an evidence-based review, relying on documentation and interviews with key positions at SaskPower, Sensus, Grid One, and the Ministry of Labour and Workplace Safety, as well as drawing on the knowledge of PwC's smart meter specialists.

Saskatoon based, Robertson Stromberg LLP is one of Saskatchewan's leading law firms. They were selected to review the contracts between SaskPower and the vendors to advise on the strengths and weaknesses of the contracts and advise on possible legal options for SaskPower, including receipt of financial compensation.

Robertson Stromberg conducted extensive interviews with SaskPower, reviewed thousands of pages of SaskPower documentation, and reviewed external sources to develop a comprehensive understanding of this Smart Meter Project. Their investigation was widespread and thorough, including contacting the legal counsel and principal litigant in *Baker v. Sensus USA et al v. Alabama Power Company*.

After their preliminary findings were developed, Robertson Stromberg retained the services of Aird & Berlis, nationally recognized for their expertise in public sector procurement, for the purpose of gaining broader context against which the contractual and procurement analysis could benefit.

The full report prepared by Robertson Stromberg will not be released in order to protect SaskPower's legal privilege in the event that future litigation is considered.

After consulting with the Association of Professional Engineers & Geoscientists (APEGS), Regina-based engineering firm, Ritenburg and Associates Ltd. (Ritenburg) was selected to provide an independent assessment of the cause of the fires. Ritenburg was engaged through Robertson Stromberg in order to protect SaskPower's legal privilege in the event of future litigation.

In performing its work, Ritenburg examined meters that burned, and meters that simply quit for various reasons, including overheating. They reviewed manufacturers' information, contracts, UL/CSA standards and surveyed publicly available information. They also conducted personal interviews with SaskPower staff who were directly involved in the Smart Meter

Project. A number of questions were also electronically posed by Ritenburg, which were subsequently answered by the topic's corresponding SaskPower employee.

SaskPower was cooperative throughout the review process by providing the consultants with necessary documentation, making staff available to be interviewed, and being forthcoming with information.

SaskPower's Settlement with Sensus

During the course of the Review, on September 8, 2014, SaskPower was able to negotiate an agreement with Sensus to recover $47 million in costs. This included a cash refund of $24 million for all meters that were already purchased, a credit of $18 million for future meters, and $5 million for research and development of a new meter designed specifically for Saskatchewan's conditions.

Key Findings

- Moisture and contaminants getting inside the meters were a major factor in the meter fires.
- There is no evidence to indicate the fires were the result of improper installation or hot sockets.
- SaskPower did not adequately consider the potential for significant meter failures resulting in damage to homes.
- SaskPower does not have two formal processes to distinguish between regular procurements and complex procurements (like those covered in the AMI Program). Complex procurements have additional complexities and should be managed by a different set of processes.
- Roles and responsibilities were not clearly defined to effectively identify initial risks, manage ongoing/added risks as incidents in other jurisdictions became public, complete adequate due diligence (i.e., assessment of product liability insurance needs), and manage the project.
- There were three critical points that, taken together, could have prompted SaskPower to re-evaluate the risk to customer safety throughout the Smart Meter Program.

Summary of Review

Overall, the issues that arose in the Smart Meter Program (Program) can be linked back to SaskPower's approach to the project. SaskPower treated the Program as a complex initiative insofar as it engaged specialist advisors to augment in-house capabilities. However, good practice would suggest complex procurements should be managed by a different set of processes than typical procurements, with increased due diligence. SaskPower does not have two formal processes to distinguish between regular procurements and procurements of high risk goods and services (like those covered in the AMI Program). SaskPower followed their approved policies and procedures, which reflect a typical procurement. While SaskPower did exercise due diligence by closely following existing procurement policies and procedures, and preparing comprehensive legal contracts with its vendors, there were several areas that the consultants indicate SaskPower fell short in terms of good practice.

SaskPower's overreliance on external consultants led to an inadequate risk management process. The majority of procurement advice was provided by external consultants who tend to have a narrow focus, which excluded SaskPower's interest or accountability for public safety. This is evident by the fact that the potential for catastrophic meter failure was never identified as a possible risk. Therefore, SaskPower did not develop controls to respond to unexpected occurrences or issues. Had this occurred, the risks associated with the Program might have been appropriately identified and managed, triggering a different reaction and/or decision at critical points throughout the project. There are a number of activities SaskPower could have taken to improve risk management and customer safety activities.

Shortcomings in Product Design

The portion of the CIC review conducted by Ritenburg concluded that there was no evidence to suggest a problem with either the sockets or the competency of the installation crews. There has been considerable public interest in SaskPower's use of "competent labour" for the installation of the meters. Of the eight fires, five were installed by journeyperson electricians or journeyperson linemen. Conditions such as high electricity loads, which can lead to hot sockets, were not present at the time of the fires, and Ritenburg believes it is unlikely that hot sockets caused the fires.

There are, however, shortcomings in the design of the Sensus Generation 3.3 Meters. There is evidence that this particular model does not seal properly to keep out moisture and contaminants, both of which could affect meter function. Precipitation levels at the site of several of the fires were unusually high prior to the incidents. Prior to SaskPower installing the meters, Sensus was working on a new model to correct the moisture issue. Features included a breather hole with a Gore-Tex filter, a drain hole at the bottom of the meter, a reduced number of moisture entry points, and improved insulation over the bus bars.

Additional Policies and Procedures Needed for Complex Procurements

SaskPower management did treat the AMI Program as a complex initiative, which is evidenced by the fact that SaskPower engaged specialist advisors to augment in-house capabilities. However, SaskPower followed the same "Purchasing Policy & Procedures" used in non-complex, low-risk procurements. Good practice involves a differentiated process, with increased controls to handle complex procurement needs, based on the level of risk associated with the equipment or service and the amount of expertise required. Some of the key activities that would be expected in complex procurements were missed, such as more rigorous due diligence. SaskPower should have taken additional precautions, such as enhancing its risk management to better respond to critical points in the project.

The Smart Meter Program was the first large scale, multi-year project to take place on customers' premises in fifty years. Although SaskPower management believed the project to be complex, SaskPower's "Purchasing Policy & Procedures" are not designed to manage complex procurements any differently than routine procurements, including increased controls to better manage risk.

Critical Points

The consultants identified three critical points in the Project that could have served as warning signs, requiring additional due diligence and, perhaps, changed SaskPower's course of action.

1. Correspondence from one of the proponents of the RFP process whose proposal was ultimately rejected in favor of Sensus. This correspondence raised the prospect that more due diligence should have been directed towards both Sensus and the product they offered. SaskPower consultants considered and, subsequently, dismissed the concerns raised by the proponent, concluding that their due diligence was adequate.

2. Litigation was initiated in 2010 in Alabama (Baker litigation) that alleged fault with the Sensus product that resulted in fires similar to those that occurred in Saskatchewan. While this litigation appears to have been dismissed by April 2011, there was no mention of this litigation by Sensus at the time it was negotiating its contract with SaskPower. SaskPower became aware of the Baker litigation in late March 2012; after the Sensus procurement contract was effective, but prior to any significant work orders being executed. This flag was dismissed by consultants as involving an earlier version meter and, thus, concluding that the litigation should not be of concern.

3. In August 2012 SaskPower became aware that PECO was dealing with issues related to overheating in meters provided by Sensus. Subsequently PECO announced the replacement of several thousand Sensus meters. We found that the implications of PECO's actions were clearly appreciated by the legal department. This concern was shared with other members of the team, who then visited PECO to learn more. However, one of the lessons available from that visit was the need to have the meters independently tested by UL, which was not done.

SaskPower became aware of these critical points and did take some additional steps, including increasing its efforts to detect faulty sockets, enabling an extra temperature sensor in the meters, and seeking assurances from Sensus that the meters were safe. The temperature sensors and remote reading function never did work properly and there were a large number of high temperature alarms, which SaskPower could not investigate due to the large volume. Even after more than 100,000 installations, SaskPower continued to read the meters manually.

According to PwC's report, good practice suggests that the PECO incident should have triggered an independent re-evaluation of the risk, which may have prompted a heightened level of caution while proceeding with the Smart Meter Program. However, no additional tests on the meters were ordered after the PECO fires became public. SaskPower did not conduct an independent due diligence assessment of Sensus, but relied on Sensus' representations of legal actions against them.

Insufficient Risk Management

All three reports, PwC, Ritenburg, and Robertson Stromberg, maintain that SaskPower had insufficiently managed risk throughout the Smart Meter Program. PwC explains that because SaskPower's procurement policies inadequately address complex procurement management, the risks associated with the Program were not appropriately identified.

Although SaskPower did many things correctly in terms of good procurement process and adhering to policy and procedure, the Corporation's risk management process was found to be lacking. While SaskPower did identify a number of risks, it did not consider the risk of a wholesale replacement of the meters due to catastrophic meter failures. Had this risk

been identified, SaskPower may have undertaken more vigorous testing and included additional safeguards in its contract with Sensus.

According to Robertson Stromberg, the risk of a safety defect is one that can be more readily identified by engineers, or by specialists in meter procurement and deployment, but no such risk was identified prior to the completion of the major contractual documents.

SaskPower received expert advice that it should purchase small batches of meters through a "stepped procurement" process, install them gradually, and watch for problems. SaskPower instead purchased over 100,000 meters in a three-week period and initiated a full-scale installation program.

Unclear Project Leadership

Leadership roles were not clearly defined to effectively manage risk, complete due diligence, and manage the contracts and vendor performance through the duration of the project. This led to unclear lines of accountability and inadequate risk assessment, communication, and follow up. Instead, critical positions were filled with external consultants whereby SaskPower overly relied on consultants to provide expertise in the areas of smart meter technology. Filling critical positions with external consultants was problematic as they lacked familiarity with SaskPower's operating environment and did not share SaskPower's interest or accountability for public safety.

Contract Development – Lacking Protection Against Product Failure

Robertson Stromberg has indicated that the contracts with Sensus and Grid One were comprehensive in addressing business issues identified by SaskPower management. Robertson Stromberg noted that improvements could have been made if proper risk identification would have taken place across various areas of SaskPower (i.e., engineering, management, and legal). The failure to adequately identify the risks led to a disconnect between the procurement team and the contract drafters who failed to include specific protection against complete product failure.

Recommendations

PwC made several recommendations including:

- The risk assessment processes should be strengthened in SaskPower's "Purchasing Policy & Procedures" to clearly require a more thorough consideration, documentation, and evaluation of risks during the development of a procurement strategy, as part of project planning, and monitored for new or changing risks.
- Roles and responsibilities regarding risk management, encompassing each enterprise risk category, especially safety risk, should be clearly identified in the "Purchasing Policy & Procedures", and assigned at the outset of the project for the duration of the procurement and subsequent contract management.
- A specific role should be defined and assigned in a complex procurement that provides for each of the following:
  - strategic procurement advice;
  - identification of all risks and requirements associated with the procurement of higher risk goods and service; and,
  - support to the contract owner in managing vendor performance and risk for the duration of the contract.

- A single point of accountability should be assigned in a complex procurement that would bring together the inputs and findings of all of these individual roles and responsibilities, and would ensure that risks are evaluated as a whole during the procurement process and subsequently throughout the lifetime of a contract.
- SaskPower should consider enhancing their "Purchasing Policy & Procedures" to provide guidelines for identifying the risk level of procurement and clear steps to manage both routine and complex procurement needs.
- SaskPower should consider formalizing a Process Safety Management Program, assigning responsibility for the Program, and integrating it into the procurement and contract management policies, procedures, and processes.
- SaskPower should continue to build and enhance vendor and contract management capabilities and procedures – including assigning a single contract owner responsible for vendor performance, and a specific governance process for managing risk.

Ritenburg made several recommendations including:

- Documentation of customer sites to help assess the factors which can impact smart meter performance (i.e., taking photos of the socket and premises before and after installation of the new meter).
- Detailed analysis of any returned meters to identify trends or problem areas (i.e., location, condition, etc.).
- Detailed documentation of the fires should be incorporated into a single safety and technical report in order to monitor trends and problems with certain types of meters. SaskPower has prepared several reports related to the eight meter fires, but they have not been consolidated into a single document, nor have they been finalized.
- SaskPower should ensure that the meters' full capabilities are tested (i.e., temperature alarms) and working in small rollouts (stepped procurement) prior to implementation including the communications system.
- Existing Sensus (Generation 3.3) meters should be replaced as soon as possible, and no later than the end of winter, prior to the spring thaw and rains. This is due to the close relationship between the previous meter fires and precipitation levels.

Robertson Stromberg made several recommendations including:

- Given that no one involved in the AMI project was alert to the risks that would flow from a safety defect, advice from risk management consultants should be sought for projects such as the smart meter initiative in order to establish processes and procedures to better identify and manage associated risks.
- Consideration should also be given to the possibility of allocating risk through the use of product liability insurance, which would be purchased by the vendor to protect the buyer, or SaskPower in this case.
- Roles and responsibilities with respect to risk management and for how to deal with external legal counsel should be more clearly defined and understood.

Next Steps

Cabinet has reviewed the reports and has directed:

- CIC to evaluate the effectiveness of the recommendations outlined in the reports and work with SaskPower to manage the implementation of those recommendations considered appropriate;
- CIC to consider the recommendations outlined in the report and determine if they can be implemented more broadly across the Crown Sector; and,
- SaskPower to remove all remaining Sensus smart meters no later than March 15, 2015.

As part of its settlement agreement with SaskPower, Sensus will develop a meter to suit Saskatchewan's conditions. It is already working on a new, more waterproof generation of meters. At that time, SaskPower and the Government will determine if they are satisfied that a new generation meter is safe and reliable, and only then will resume the smart meter installation program.

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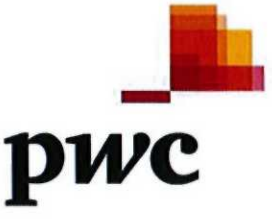
Crown Investments Corporation

SaskPower Smart Meter Procurement and Contract Management Review

Report of Facts and Findings

October 23, 2014



Contents

Appendices

1 Executive Summary

For some years, SaskPower has been planning an Advanced Meter Infrastructure ("AMI") program as part of a broader Service Delivery Renewal ("SDR") program to modernize its existing infrastructure. The AMI program includes procurement of smart meters (referred to as "Solution") and the installation of these meters (referred to as "Deployment") at SaskPower's customer premises. The total program involved the planned installation of approximately 500,000 smart meters over an expected twenty-one month period ending June 30, 2015. Sensus USA Inc. ("Sensus") and Grid One Solutions Canada ULC ("Grid One") were selected as the primary vendors ("Vendors") for "Solution" and "Deployment", respectively.

SaskPower began a full roll-out of the smart meter installation on October 17, 2013. On July 10, 2014, after four "catastrophic meter failures" (e.g. a meter which has burnt, melted, blackened, caught fire, arced, sparked, or exploded/blown from the premise) occurred in June 2014, SaskPower implemented a "safety stand-down" of the program resulting in no further smart meter installations than the 105,000 meters already installed. These meter failures caused damage to some property and potential safety risks to residents. Subsequently, in July and August 2014, four additional such failures occurred and the Government of Saskatchewan ("Government") ordered the removal and replacement of all the installed Sensus smart meters on July 30, 2014.

At the direction of Government, the Crown Investments Corporation ("CIC") of Saskatchewan initiated a series of independent reviews of the AMI program from a legal, technical and procurement perspective.

PricewaterhouseCoopers LLP ("PwC") was engaged to review SaskPower's Purchasing Policy & Procedures that were in effect during the period of the procurement of the Solution and Deployment Vendors for the AMI program. This review was to be performed in the context of whether any findings could have potentially reduced or mitigated the impact of the current decision to cancel the program, and was therefore intended to identify, review and comment on:

- SaskPower's adherence with its Purchasing Policy & Procedures;
- Any significant gaps or deficiencies in SaskPower's Purchasing Policy & Procedures when compared with good practices that we have observed in other similar organizations; and
- SaskPower's ongoing contract and vendor management and due diligence procedures related to the Smart Meter program after the vendor selection.

PwC was not engaged to identify the cause of the Smart Meter failures or complete any legal due diligence relating to any recourse that SaskPower may have following the smart meter failures.

We considered SaskPower AMI procurement activities from May 29, 2009, when the SDR was approved by the Board of SaskPower, through to July 30, 2014, when the Government ordered SaskPower to remove the smart meters that had been installed.

This report outlines the key facts and findings arising from our review, and recommendations that could improve SaskPower's procurement activities going forward.

It is important to note that, during the review, PwC had the full co-operation of SaskPower's staff, contractors, advisors (Enspiria and UISOL) and primary vendors, (Sensus and Grid One). The information that we requested was provided in a timely and professional manner and access was provided to the individuals and information required to perform the review.

The procurement review was conducted between August 26, 2014 and October 10, 2014 and was designed to meet the services agreed upon in our letter of engagement with CIC dated August 26, 2014.

Key Facts and Findings

A. Purchasing Policy & Procedures – Compliance Review

We concluded that:

- SaskPower's purchasing team ran an open, fair and transparent procurement process. There was no evidence of any significant instance or example of non-compliance to the 2007 Purchasing Policy & Procedures in effect at the time of the procurement. For the purpose of this report, significant non-compliance would include any instance or example that could have prevented the occurrence of the failures that led to the decision to remove the meters.
- SaskPower engaged technical advisors to support their smart meter procurement and installation program where it was determined they needed to augment their in-house capabilities.
- The documentation of the AMI program, particularly the procurement process, was good. This is indicative of the level of oversight, controls and the importance that management attributed to the program.
- SaskPower considered the technical risks of the program in their AMI procurement approach. The steps taken to identify and address these risks reflected in-house views and input from advisors, and included setting out detailed technical specifications in the RFP referencing industry standards, validating bidder representations made in the proposal process, and executing on a detailed meter testing and acceptance process including a pilot field test at Hanley.

Areas of Concern

Based on the work performed, we identified two key areas of concern:

1. **Catastrophic Meter Failure Was Not Identified as a Risk**

   The primary issue of catastrophic meter failures which prompted the AMI program to be halted was not identified as an initial program risk. When additional information about smart meter fires from other sources came to light, the risk of catastrophic meter failures did not prompt an independent re-evaluation of the risk related to Sensus smart meters. An escalation of the risk assessment could have prompted additional investigation, testing, and either closer monitoring of installed meters or a pause to the roll-out of smart meters until issues were better understood.

   Although we cannot determine whether any actions could have prevented the smart meter fires from occurring in Saskatchewan, consideration of catastrophic meter failures should have occurred at the outset of the program. In light of the fires at the Philadelphia Electric Company ("PECO") in August 2012 which prompted PECO to halt their smart meter program, SaskPower responded with legal risk mitigation by way of contract terms and representation from Sensus, and certain actions based on limited information provided by PECO, but did not then investigate the risk of catastrophic meter failure and the impact on customer safety to the extent undertaken once the fires occurred in Saskatchewan.

2. **Unclear Roles and Responsibilities in the Purchasing Policy & Procedures**

   The Purchasing Policy & Procedures document does not clearly identify the roles and responsibilities for the management of enterprise risks relevant to procurement and, specifically, a single point of responsibility for the consideration of safety and supplier risks during procurement that brings together inputs and findings of all of the roles and responsibilities in procurement, in order to evaluate and mitigate these risks as a whole during the procurement process, and subsequently throughout the lifetime of a contract.

Further, a specific gap in the performance of the Procurement role, as defined in the Purchasing Policy, was to provide strategic procurement advice to the team. In this case, the role was filled by an external industry smart meter specialist, and not a procurement specialist. While this is not uncommon for these types of programs, there is risk involved when the majority of procurement advice is provided by external individuals, as this can result in a narrow focus limited to their specialty, without the independence and challenge that an experienced internal procurement specialist advisor would bring. Involving a procurement specialist to provide strategic advice in addition to insights from industry specialists would be expected and can enhance risk management while bringing forward some of the concepts outlined in the good practices section.

Specific responsibility for the identification and management of all potential risks related to procurement may have helped mitigate the impact to the program related to certain safety risks.

B. Purchasing Policy & Procedures – Comparison to Good Practice

There is no common industry-wide standard that is widely agreed upon to determine "good" or "expected" practices when it comes to comparing procurement, contracting, due diligence and contract management processes. We noted several areas of the SaskPower AMI procurement that could be considered to be good practices; for instance, the use of:

- A well thought through sourcing strategy with a plan to reduce risk while maximizing value for money and managing supply continuity risk; and
- A two-stage procurement process which included an initial Request for Quotation (RFQ) to identify capable AMI solution providers to accommodate a more efficient and effective Request for Proposal (RFP) process.

Areas of Opportunity

We also identified a number of areas that present opportunities for enhancing SaskPower's Purchasing Policy & Procedures, when compared against industry good practice.

1. Complex Procurement Management

The procurement of high risk goods and services (like those covered in the AMI program) has additional complexities and should be managed by a single point of contact in Procurement with a different set of processes, increased controls, leadership, and levels of specialist support, with individuals who are familiar with managing end-to-end risks. One specific example that we observed is in the area of due diligence.

Good practice from a Complex Procurement perspective and long term vendor arrangement would suggest that more robust due diligence be performed with respect to the vendor organization when certain criteria are met, especially in situations where they are not already known to SaskPower or it is identified as a higher risk or Complex Procurement. Examples include more diligence around historical legal issues, closer involvement and coordination of these activities by Procurement, and extra steps around independence to avoid too much reliance on third party vendor representations, as was experienced with Sensus. More specific guidance around due diligence would help manage financial, legal, reputational and safety risks.

2. Process Safety Management and Safeguards

Process Safety (meaning the integration of safety practices covering multiple areas that include infrastructure of facilities, information networks and, customer premises) should be expanded in the Policy & Procedures to address this aspect at the same level as it does for a SaskPower employee or contractor safety. This is an evolving discipline but, given SaskPower's stated priority for safety, this

good practice should be built into the Policy & Procedures to ensure that all aspects of safety are considered in future procurements.

3. **Vendor and Contract Management Capabilities to Manage Risk**

   These capabilities are primary vehicles that can hold vendors accountable to the contract to help better anticipate and manage risks associated with high impact suppliers through the duration of the contract. Good practice would involve a formalized program with a governance structure that is outlined in the contract supported by specific vendor scorecards with performance measurement of service, safety, cost, quality and risk. Implementing these capabilities at SaskPower would help ensure that suppliers are managed with this broader risk lens over the life of the contract, and would be better positioned to monitor and respond to risks related to a vendor or identified in the industry.

It is important to note that, while it cannot be determined whether the application of these good practices could have potentially reduced or minimized the impact of the incidents, they would have helped play a role in the assessment and management of risk during the AMI program. We have provided recommendations for improvement to be considered to assist SaskPower in moving their procurement process towards good practices.

Summary

SaskPower had in place Purchasing Policy & Procedures that would be comparable to what we have observed in similar Crown Corporations and Power Utilities, and these were followed throughout the AMI program. SaskPower management treated the AMI program as a complex initiative and engaged specialist advisors to augment in-house capabilities. However, roles and responsibilities related to procurement were not clearly defined, fulfilled nor assigned for the management of enterprise risks relevant to procurement, and specifically for safety risks. In addition, some of the key activities that would be expected from a good practice perspective in Complex Procurement were missed, such as sufficient due diligence.

During the smart meter roll-out period, SaskPower became aware of the risks associated with comparable failures in another jurisdiction and responded to address what it perceived to be the cause of the failures. However, their response did not address the real root cause of the failures, which suggests that the impact of the subsequent failures in Saskatchewan might have been mitigated if SaskPower had applied the same rigour to re-evaluate the risks in their own smart meter program as would have been expected had the incidents at PECO occurred in Saskatchewan. An escalation of the risk assessment could have prompted additional investigation, testing, and either closer monitoring of installed meters or a pause to the roll-out until the issues were better understood.

As a result, we recommend the following:

1. The risk assessment process should be strengthened in the Purchasing Policy & Procedures to clearly require a more thorough consideration, documentation and evaluation of risks as potential risk indicators are identified during the development of a procurement strategy, as part of project planning, and monitored for new or changing risks during the period of the contract.
2. Roles and responsibilities regarding Risk Management, encompassing each enterprise risk category, and specifically safety risk, should be clearly identified in the Purchasing Policy & Procedures, and assigned at the outset of the project for the duration of the procurement and subsequent contract.

3. A specific role should be defined and assigned in a Complex Procurement that provides for each of the following:
   a. strategic procurement advice,
   b. identification of all risks and requirements associated with the procurement of higher risk goods and services, and then
   c. support to the contract owner in managing vendor performance and risk for the duration of the contract.
4. A single point of accountability should be assigned in a Complex Procurement that would bring together the inputs and findings of all of these individual roles and responsibilities, and would ensure that risks are evaluated as a whole during the procurement process and subsequently throughout the lifetime of a contract.

2 Project Background

SaskPower is a vertically integrated electric utility providing generation, transmission, distribution and retail services. SaskPower generates or buys electricity supply from a generating fleet that uses a wide range of fuels (e.g., coal, hydro, gas, and wind). SaskPower has the exclusive franchise to supply, transmit, and distribute electricity and provide retail services to customers in Saskatchewan. Two cities, Saskatoon and Swift Current, have retained their municipal franchise to supply and distribute electricity.

Service Delivery Renewal ("SDR")

SaskPower's Service Delivery Renewal Program is a multi-year initiative aimed towards improving service quality, productivity, efficiency and system reliability. The SDR initiative includes re-engineering the processes used to service customers, from the customer's initial contact through to connection, as well as dealing with complaints and queries, meter reading, and maintaining distribution infrastructure.

The SDR Program has led to improvements to customer service through initiatives such as the implementation of a new enhanced billing system, a new interactive telephony system and more timely and efficient dispatch processes through laptops in service trucks.

A key initiative under the SDR Program is Advanced Metering Infrastructure ("AMI"), which aims to improve customer service, offering near real time monitoring of electricity consumption data and operations through the installation of smart meters. Smart meters can offer many future benefits, including meter readings that largely eliminate billing based on estimates, faster service connects and disconnects, and quicker identification and tracking of power outages once supporting technology is in place.

Advanced Metering Infrastructure ("AMI")

SaskPower's AMI program consists of the replacement of SaskPower's existing electric meters with an AMI electric meter and retrofitting SaskEnergy's gas meters with a two-way AMI communication module, installed at a customer's home, farm or business.

AMI also includes a provincial communication network to transmit information from the AMI meters to SaskPower, where the data will be integrated into corporate systems for customer billing and other operational purposes. The key customer benefit associated with AMI is increased operational efficiency and real time information, which will allow earlier detection of outages.

Full AMI deployment involves installing approximately 500,000 electric smart meters and approximately 360,000 gas meters retrofitted with two-way AMI communication. These devices will communicate across a network consisting of approximately 400 tower sites across the province. These are primarily existing SaskTel tower locations where AMI equipment is then installed.

The AMI program was approved by the SaskPower Board of Directors in August 2010 with an associated budget of $190 million. Over the next year, SaskPower and SaskEnergy completed key project vendor procurements, and ultimately selected Sensus USA Inc. for the supply of the AMI solution (electric and natural gas meters/modules, communication base stations, and associated information technology systems) and Grid One Solutions Inc. for electric meter and gas module installation.

AMI Program Governance Structure

The AMI program was organized according to the following structure:

- An Executive Steering Committee ("ESC") responsible for the overall management of the program and reporting to the Board of Directors.
- The AMI program was separated into four identified streams of procurement and implementation. Each stream had an identified project manager. The four streams were as follows:
  - AMI Solution (the "Solution") which included the actual smart meters, the physical network infrastructure (i.e. communication towers) and the communications system to transmit data from the meters to SaskPower;
  - Deployment which is the physical installation of the meters on customers' property;
  - Meter Data Management Systems ("MDMS") which includes management of all the data received at SaskPower from the Solution network system; and
  - SAP Integration which is the integration of the data received into SaskPower's billing system to generate invoices to the customers based on the data received.
- A Purchasing Agent was assigned to each of the four streams as the Purchasing Department liaison. The same Purchasing Agent was responsible for all four streams.

In addition, SaskPower engaged external consultants to provide management support in regards to smart meter expertise and project management. The primary consultants to the AMI program were the following:

- Enspiria (Subsequently acquired by Black and Veatch) – Enspiria was engaged in September 2009 to initially provide AMI specific advice towards SaskPower's AMI business case, and subsequently assisted in developing the RFP and evaluation criteria for the AMI program procurement streams. Post procurement, Enspiria consultants continued to assist the SaskPower project managers with contract management activities.
- Utility Integration Solutions Inc. ("UISOL") – UISOL was engaged to provide an assessment (i.e. a "health check" of current state and future plans for the AMI program). A February 1, 2012 report identified areas for improvement, specifically around testing and project management. On March 12, 2012, a Statement of Work ("SOW") was signed with UISOL to directly provide additional project management capabilities and a UISOL employee was assigned to work with SaskPower in this capacity.

Smart Meter Deployment & Industry Developments

Equipment delivery began in early 2012, as did laboratory and field testing activities. These activities continued through the fall of 2013 when full meter and module deployment commenced.

Early in 2012, a legal complaint filed by a former employee against Sensus in 2010 was made known to SaskPower. The employee claimed he was wrongfully dismissed for raising concerns of smart meter fires that occurred in 2009. In the summer of 2012, PECO postponed its smart meter program and later replaced its Sensus meters due to incidents of fires occurring.

In July/August of 2012, SaskPower and Grid One Solutions each submitted a request to the Saskatchewan Department of Labour Occupational Health and Safety Division for an exemption from Section 451(1) of The Occupational Health and Safety Regulations, 1996 ("OHSR"). The requested exemptions would allow the use of "Competent Workers" in lieu of "Qualified Electrical Workers" to perform electrical work (i.e. removal of existing watt-hour meters and the installation of new digital

watt-hour meters while under an energized state). We understand that the OHSR defines a Qualified Electrical Worker as a certified trade-person with a journeyperson's certificate either electrician or power lineperson trades. The OHSR also defines a Competent Worker as one who is being trained to perform a task and works under close and competent supervision during that training. The intent of using Competent Workers was primarily to enhance the pool of installer candidates available in Saskatchewan and to manage costs. We were advised that the initial supervision ratio was one Qualified Electrical Worker for every ten Competent Workers. After the PECO incidents were known in the summer and fall of 2012, the ratio was increased to one for every five Competent Workers.

The exemptions were granted to SaskPower and Grid One in July 2013 subject to certain conditions (e.g. requirements around training and supervision of workers) with an expiration date in August 2014. The AMI program first used Competent Workers in October 2013 when SaskPower began their full roll-out. The Grid One Competent Worker exemption was rescinded in February 2014 due to the use of subcontractors rather than direct employees of Grid One. In March 2014, SaskPower hired the competent workers who were installing the smart meters and who had been originally contracted by Grid One from Saskatchewan Manpower. These installers became members of the International Brotherhood of Electrical Workers ("IBEW") union and continued to work as installers under the SaskPower exemption.

By the end of July 2014, approximately 105,000 electric meters and 75,000 gas modules were installed, and 280 network sites had been commissioned.

Between June and August 2014, eight newly installed smart meters overheated resulting in damage to the meter and in some cases the customer property. These failures caused the Government of Saskatchewan to direct SaskPower to replace the 105,000 newly installed smart meters with meters similar to those previously installed at these locations (identified as "legacy meters").

Sensus reached a settlement with SaskPower on September 9, 2014. Terms disclosed to media include a refund to SaskPower of $24 million for existing smart meters, $5 million for new product design for the Saskatchewan climate and $18 million in credit towards new meters to be purchased from Sensus. The full terms of the settlement were not included in the scope of our review.

Crown Investments Corporation of Saskatchewan ("CIC")

CIC is the holding company for the province's commercial Crown corporations including SaskPower. CIC is conducting an external review of SaskPower's smart meter program, as directed by Cabinet, to assess the adequacy of SaskPower's processes to ensure safe and effective implementation of the AMI program. Accordingly, PwC was engaged to conduct a review of SaskPower's procurement and contract management processes related to the AMI program. The outcomes of this review are summarized in this report.

3 Scope and Limitations

The scope of this review was defined under the CIC-SaskPower Smart Meter Review Terms of Reference dated August 8, 2014. CIC has engaged PwC to perform the following advisory services:

- Review and assess whether SaskPower staff complied with SaskPower's established procurement and contracting policies and procedures in effect during the procurement that led to the selection of the Solution (smart meter) provider Sensus USA Inc. and Deployment (smart meter installation service) provider Grid One Solutions Inc. (collectively referred to as the "Vendors"). This review should identify any areas where policies and procedures were not complied with, highlighting any areas of non-compliance that could have potentially mitigated the impact of the current decision by Cabinet to cancel the program.
- Compare and comment on SaskPower's procurement and contracting policies/procedures and subsequent contract management as applied in the AMI program to industry good (expected) practices as understood by PwC, with reference to the Vendors, highlighting any policies or practices that, had they been applied, could have mitigated the impact of the current decision to cancel the program.
- Identify, review, assess and comment on SaskPower's ongoing contract and vendor management and due diligence procedures related to the AMI program as applied during the period after vendor selection and before the recent Cabinet Decision to cancel the program.

In addition, the review should understand and document the timeline of the procurement process and installation, and compare it to a timeline of information relevant to the AMI program that became publically available.

Certain matters were identified and agreed with CIC management as being out-of-scope for the purposes of this review, including a forensic investigative review (e.g. e-mail scans, background checks) and SaskEnergy's role and involvement in the procurement processes.

We did not provide services in relation to the legal elements of the contract and technical review of the equipment and installation. In particular, the following was out of scope for the purposes of this review:

- Legal due diligence related to, but not limited to:
  - breach of contract termination and dispute resolution if performance or safety issues emerge;
  - payment terms and holdbacks to protect SaskPower's financial interests in the event of problems; and
  - SaskPower's ability to receive compensation in the event of issues with the Vendors.
- Assessment of the cause of the smart meter failures.

We have been advised that CIC separately engaged a legal firm and an engineering firm on CIC's behalf in this regard. We were not given access to the findings from the legal review because of legal privilege. CIC will consolidate the results of all the reviews.

We did not have access to certain documentation that was restricted by direction of CIC and legal counsel to support legal privilege and/or confidentiality.

We were not engaged to audit the completeness and accuracy of meter or vendor performance information or other data created for or provided to us. When possible, we verified numbers reported

with underlying information. We gained reasonable comfort regarding the information received through review of certain documentation provided and confirmation through separate interviews of different individuals.

We were provided with extensive documentation related to the AMI procurement and installation oversight process. We limited our review to key documents we determined to be most relevant to the scope of our review and that could reasonably be reviewed within the period of review as confirmed with CIC.

We provide no opinion, attestation or other form of assurance with respect to our work or the information upon which our work is based. The procedures performed did not constitute an examination or a review on accordance with generally accepted auditing standards or attestation standards. We did not audit or otherwise verify the information supplied to us. We are not lawyers; we did not provide legal advice.

Our review was conducted between August 26th and October 10th, 2014 and entailed a review of documents provided by SaskPower, external market research, and interviews with select individuals related to the procurement of the Vendors. Our findings were reviewed with CIC and SaskPower Executives to confirm the facts upon which our review was based.

4 Project Approach

Our review was designed to meet the objectives of the topic areas and specific issues identified in the CIC Terms of Reference dated August 8, 2014. Our approach to the SaskPower smart meter review is summarized in the following three phases:

Phase 1: Mobilize and Preliminary Review

During the Mobilize & Preliminary Review phase, we acquired an in-depth understanding of the AMI program, and the purchasing policies and procedures in place at SaskPower at the time of the AMI program. This understanding was obtained through initial interviews with senior management and by reading certain organizational documents, the Purchasing Policy & Procedures document and other information made available.

During this phase, we mobilized our engagement team and developed a detailed project plan. We engaged eight of our global smart meter specialists to gain insight and knowledge on trends and good practices specific to smart meter programs. In developing our plans, we identified our preliminary list of interviewees, including an individual from each of the two vendors, key subject matter specialists engaged by SaskPower, and the Deputy Minister and Executive Director of the Saskatchewan Ministry of Labour Relations and Workplace Safety. We determined the procedures to be carried out during the detailed review and assessment phase and assigned accountabilities to individual review team members.

Our engagement began with the review of the available background information followed by separate planning meetings between the PwC Team, the CIC and SaskPower's senior management.

In Phase 1 of our review, we performed the following key activities:

a. Submitted an initial data and information request (before the onsite project fieldwork start date).
b. Reviewed SaskPower's policies and related procedures with respect to procurement and contracting in effect at the time of the Vendor procurement.
c. Held a planning session with CIC and SaskPower separately to gain insights, understand specific areas of concern, confirm the project scope of work, develop preliminary list of interviewees, confirm report format, agree on project governance protocols, and agree on the proposed timelines.
d. Conducted a preliminary meeting with senior management at SaskPower to discuss the Purchasing Policy & Procedures document, related processes and planned stakeholder interviewees.
e. Established a view on the key risks / focus areas that may have contributed to the issues with smart meters as part of the AMI program. We also established a view of the significant aspects of the Purchasing Policy & Procedures document for focus in our review of compliance with those policies and procedures.

Phase 2: Detailed Assessment

In Phase 2 we reviewed and assessed the adequacy of SaskPower's due diligence, procurement and contract management practices related to the AMI program in comparison to their policy, procedures and good practices. We performed this review and assessment for both the equipment supplier ("Solution") and the installation supplier ("Deployment").

This phase commenced with a detailed review of documentation related to the AMI program and other documentation as provided to us by SaskPower management. We developed detailed interview guides, scheduled and conducted interviews and continued discussions with our smart meter specialists.

In Phase 2 of our review, we performed the following key activities:

a. Conducted in-depth interviews of each interviewee with follow-up discussions as needed. The majority of our interviews were conducted on-site in Regina. We interviewed over 30 different individuals in relation to the AMI procurement and contract management activities, which included but were not limited to the following individuals:
   - President and Chief Executive Officer ("CEO"), VP Finance and Chief Financial Officer ("CFO"), VP of Operations and Chief Operating Officer, VP Customer Services, VP Law Land & Regulatory Affairs and General Counsel, VP Information Technology & Security and CIO, and VP Human Resources;
   - Manager of Service Delivery Renewal, Director of Internal Audit, Manager of Safety/Business Continuity & Emergency Planning, Manager Distribution Construction, Chief Safety Officer, Director of Business Analysis and Risk Management;
   - Consultants and subject matter specialists (e.g. Enspiria, UISOL) and external legal counsel;
   - Representatives from Sensus and Grid One; and
   - Deputy Minister and Executive Director of the Saskatchewan Ministry of Labour Relations and Workplace Safety.

b. Performed market scan on good practices, trends, insights and experiences with smart meter installation programs in other jurisdictions, based on discussions with PwC smart meter specialists.

c. Reviewed information and documentation provided which spanned the period of procurement to the time of cancellation of the program. This information and documentation from SaskPower included, but was not limited to the following:
   - 2007 Purchasing Policy & Procedures (in effect at the time of the procurement process);
   - SaskPower Code of Conduct, including Conflicts of Interest Policy;
   - AMI Business Case;
   - Request for Qualifications ("RFQ") for Solution;
   - Request for Proposal ("RFP") for Solution and the RFP for Deployment;
   - Evaluation Criteria & Scoring for Solution and Evaluation Criteria & Scoring for Deployment;
   - Master Services Agreement ("MSA") with Sensus and MSA with Grid One, Statements of Work ("SOWs") for Sensus and Grid One;
   - SaskPower Request for "Competent Worker Exemption" and approval granted by the Ministry of Labour Relations and Workplace Safety; and
   - Certain AMI program status update reports (e.g. Board and program management) and certain Internal Audit and Third Party Reports (e.g. review of purchase orders and procurement practices, ERM Gap Assessment).

d. Conducted an assessment of the procurement and contract management processes and procedures covering Vendor Evaluation & Selection (Pre-Contract) and Program Execution & Management (Post-Contract).

e. Performed an assessment on each process area for both smart meter supplier and installation provider covering:
   - Comparing the Purchasing Policy & Procedures and related processes to good practice processes and controls;
   - Identifying the areas of risk exposure in the policies, processes and procedures used;
   - Gaining an understanding of the level of risk management that was employed across the process areas; and
   - Identifying the due diligence performed.

f. Gained an understanding of and documented the timeline of the procurement process and installation, and compared it to a timeline created of key information about issues with smart meters that became publicly available.
   - Identified relevant smart meter information that could have been available to SaskPower, the timing of that information, and what responses were considered or undertaken by AMI program management.

g. Analysed findings from the review and interviews to identify the control and process gaps.

h. Provided a perspective on which gaps played a possible role in leading to the identified issues.

i. Contacted representatives of Procurement within other Crown Corporations to collect further insight regarding gaps to good practice at peer organizations.

j. Provided recommendations with respect to identified weakness or gaps in SaskPower's policies and procedures, in the execution of both procurement processes, and in the AMI project contract management/monitoring.

Phase 3: Reporting and Close-Out

During the Reporting & Close-Out Phase, we accumulated information and analysis performed during our detailed review and assessment, reviewed the assessment for completeness, performed follow-up enquiries and collected additional information and detail as required. Our consolidation of findings included the initial phases of report writing. We held initial discussions of our findings and recommendations with our smart meter specialists and with CIC. We validated our findings subsequently with senior management of SaskPower to confirm the accuracy of our facts and provide opportunity for SaskPower to identify any additional information that we may have missed.

In Phase 3 of our review, we performed the following key activities:

a. Issued a draft written report to review with the CIC, addressing the objectives of the assignment, details of the work performed, our findings and recommendations; and

b. Issued a final report.

This report of Facts and Findings represents the final outcome of all phases of our review.

5 Facts and Findings – Procurement and Contract Management

This section outlines the key facts and findings from our review of SaskPower's Purchasing Policy & Procedures. The objective of our review was to identify whether any gaps existed in what we would fundamentally expect to find in a Purchasing Policy & Procedures, and whether SaskPower performed the procurement during the AMI program in accordance with them. Where we had findings, we provided recommendations that may help improve SaskPower's Purchasing Policy & Procedures going forward. In addition, this section provides facts and findings related to our review of contract and vendor management.

A. Compliance with Purchasing Policy & Procedures

An Overview

We reviewed and assessed whether SaskPower complied with its established Purchasing Policy & Procedures in place at the time, in relation to the selection of the smart meter supplier Sensus and the meter installation service provider Grid One Solutions. The Purchasing Policy & Procedures reviewed were approved by the SaskPower Board of Directors on September 7, 2007.

We provide the following high level observations:

- SaskPower's purchasing team ran an open, fair and transparent procurement process. There was no evidence of any significant instance or example of non-compliance to the 2007 Purchasing Policy & Procedures in effect at the time of the procurement. For the purpose of this report, significant non-compliance would include any instance or example that could have prevented the occurrence of the failures that led to the decision to remove the meters.
- SaskPower engaged technical advisors to support their smart meter procurement and installation program where it was determined they needed to augment their in-house capabilities.
- The documentation of the AMI program, particularly the procurement process, was good. This is indicative of the level of oversight, controls and the importance that management attributed to the program.
- SaskPower considered the technical risks of the program in their AMI procurement approach. The steps taken to identify and address these risks reflected in-house views and input from advisors, and included setting out detailed technical specifications in the RFP referencing industry standards, validating bidder representations made in the proposal process, and executing on a detailed meter testing and acceptance process including a pilot field test at Hanley.

Notwithstanding the overall adherence to the Purchasing Policy & Procedures, we note the following two key findings.

1. Catastrophic Meter Failure Was Not Identified as a Risk

The primary issue of catastrophic meter failures which prompted the AMI program to be halted was not identified as an initial program risk. When additional information about smart meter fires from other sources came to light, the risk of catastrophic meter failures did not prompt an independent re-

evaluation of the risk related to Sensus smart meters. An escalation of the risk assessment could have prompted additional investigation, testing, and either closer monitoring of installed meters or a pause to the roll-out of smart meters until issues were better understood.

2. Unclear Roles and Responsibilities in the Purchasing Policy & Procedures

The Purchasing Policy & Procedures document does not clearly identify the roles and responsibilities for the management of enterprise risks relevant to procurement, and specifically, a single point of responsibility for the consideration of safety and supplier risks during procurement that brings together inputs and findings of all of the roles and responsibilities in procurement, in order to evaluate and mitigate these risks as a whole during the procurement process and subsequently throughout the lifetime of a contract. We also noted that the strategic procurement role defined in the Purchasing Policy could have been more effectively fulfilled by a procurement specialist rather than the industry smart meter specialist that performed the role.

These two findings will be explained in more detail in the following section.

Detailed Facts and Findings

As part of our review, we looked at SaskPower's Purchasing Policy & Procedures, and whether SaskPower adhered to them. In addition, CIC requested that we also look at a number of specific areas, which we also report on in this section. This section is organized to describe highlights of our observations, areas of concern and non-compliance, and recommendations to address these areas.

1. Business Cases/Strategy/Plan

- An Executive Steering Committee was established at the outset of the program that was responsible for the overall management of the program and reporting to the Board of Directors.
- Separate project managers were assigned to each of the four identified streams of procurement and implementation and reported to the Executive Steering Committee. These streams were: AMI Solution, Deployment, Meter Data Management Systems and SAP Integration.
- An overall governance structure was created to manage the SDR and AMI programs; this included executive level representatives at Vice President and General Manager Levels, and a well-structured organization existed under the AMI Manager to manage the four work streams.
- The governance structure was supported with a documented process for generating reports of the AMI program at agreed upon frequencies (daily/weekly/bi-weekly/monthly).
- Reporting to the Board and Executive was done by the Management of SaskPower every 2-3 months. These reports provided updates on the schedule, costs, and any other highlights that management wanted to share with the Board.

2. Initial Planning and Smart Meter Supply Market Analysis

- SaskPower met and interviewed 12 of the top 15 smart meter vendors in 2010/2011, and also communicated with utilities in its peer group in Canada and North America to develop an understanding of their experiences with smart meter programs.
- Experienced consultants were contracted to provide subject matter expertise in writing a business case to seek executive approval for the AMI program; the external consultants that were employed brought in their knowledge of the supply market to support SaskPower in developing a better understanding of the market.
- Following the approval of the business case, SaskPower followed a 2 stage procurement process which included a Request for Qualification stage to shortlist qualified bidders for the Request for Proposal stage of the Solution and the Deployment procurement.

3. Vendor Pre-Qualification Process

The table below outlines the procedures included within the Request for Information (RFI) section of the Purchasing Policy & Procedures. The Purchasing Policy & Procedures do not specifically identify requirements for a Request for Qualifications (RFQ). That said, the RFI section of the Purchasing Policy & Procedures is the most comparable area of this document to the RFQ process performed in order to establish a list of qualified bidders for the Solution procurement. As such, any mention of RFI in the procedures noted below is assumed to be in relation to the RFQ process undertaken by SaskPower. This section of the Purchasing Policy & Procedures document outlines the following procedures for each associated role.

Role	*Procedure (Extract from 2007 SaskPower Purchasing Policy & Procedures)*
Requisitioner	Establish detailed criteria for reviewing submissions in response to the RFI.
Purchasing Dept.	Create a vendor list.
Purchasing Dept.	Issue the RFI to each vendor on the list.
Purchasing Dept.	Receive and manage all vendor questions, including: a) answering all questions related to the purchasing process; b) forwarding all questions related to the items/services or the project to the Requisitioner; and c) consulting with the Requisitioner and the Legal Department on all legal questions.
Purchasing Dept.	Time and date stamp all submission packages from vendors as they are received and lock them each into the Bid Depository.
Purchasing Dept.	Hold an RFI Opening with the Requisitioner or another SaskPower employee (No consultants or contractors may attend) - if the dollar value is more than $200,000 the Internal Audit Department must attend the RFI Opening, but may attend any RFI opening at their discretion.
Requisitioner	Complete a preliminary evaluation of the submissions to determine whether they have addressed all the technical and commercial questions or issues set out in the RFI. (See: Evaluation in Competitive Purchasing). No consultants or contractors that stand to gain from the purchasing process may be involved in the preliminary evaluation.

With respect to our findings for the above noted procedures that were complied with for the Solution procurement, we also note the following:

- The Procurement strategy for the AMI Solution included a RFQ process that was advertised publicly on SaskPower's website and administered through MERX, a public tendering site used for public sector procurement, to allow any interested company to participate in the bidding.
- The RFQ established baseline requirements for vendors based on experience in North American deployment of smart meters, working with both gas and electric meters, and Measurement Canada certification that was used to evaluate and score the responding vendors and identify those best suited to be invited to respond to the subsequent RFP process (see below).
- Questions raised by proponents were addressed to the Purchasing Department who then requested answers and or clarifications from Legal or the Business unit, as required, and provided the answers to all proponents by way of updates on the MERX system.
- The RFQ opening was held and attended by Purchasing, Internal Audit and the Requisitioner.

- The RFQ process assisted SaskPower in streamlining the Solution procurement process by identifying the most suitable proponents upfront and therefore reducing the potential time requirements for both vendors to develop responses and for SaskPower to review detailed technical proposals from bidders that were not qualified to do the required work.

4. Request for Proposal (RFP) Preparation and Approval

The table below outlines the procedures included within the RFP section of the Purchasing Policy & Procedures and identifies the responsible party:

Role	*Procedure (Extract from 2007 SaskPower Purchasing Policy & Procedures)*
Requisitioner	Advise the Purchasing Supervisor of any possible conflict of interest.
Requisitioner	Submit detailed, weighted evaluation criteria acceptable to Purchasing before the RFP is issued. No consultants or contractors who may stand to gain from the purchasing process may be involved in the development of the evaluation criteria.
Purchasing Dept.	Create a Letter of Invitation and outgoing and incoming Proposal labels for each proponent.
Purchasing Dept.	Issue the RFP to each proponent.
Purchasing Dept.	Receive and manage all proponent questions, including: a) answering all questions related to the purchasing process; b) forwarding all questions related to the items/services or the project to the Requisitioner; c) consulting with the Requisitioner and the Legal Department on all legal questions.
Purchasing Dept.	Time and date stamp all submitted proposal packages from vendors as they are received and lock them each into the Bid Depository.
Purchasing Dept.	Hold an RFP Opening with the Requisitioner or another SaskPower employee (No consultants or contractors may attend) — if the dollar value is more than $200,000 the Internal Audit Department must attend the RFP Opening, but may attend any RFP opening at their discretion.
Requisitioner	Complete a preliminary evaluation of the submitted proposals to determine whether they have addressed all the technical and commercial requirements set out in the RFP. No consultants or contractors that stand to gain from the purchasing process may be involved in the evaluation.
Requisitioner	Provide the Purchasing Department with a shortlist of Proponents that may be asked to provide product demonstrations or to attend evaluation interviews.
Purchasing Dept. / Requisitioner	Conduct any demonstrations and evaluation interviews with short-listed proponents.
Purchasing Dept. / Requisitioner	Once all demonstrations and evaluation interviews are completed, using the evaluation criteria submitted to the Purchasing Department, complete the evaluation of all the short-listed proposals.
Purchasing Dept. / Requisitioner	Submit a complete evaluation analysis including the recommended award to the Purchasing Department for review and approval.
Purchasing Dept.	Advise all unsuccessful Proponents that an award has been made, and, if requested by a Proponent, conduct a debriefing.
Legal Dept.	Either draft or approve the final form and content of a negotiated contract.

With respect to our findings for the above noted procedures that were complied with for both the Solution and Deployment procurements, we also note the following:

- SaskPower used a prescribed form called an Authorization to Issue form that initiates the RFP process and informs Purchasing of the procurement exercise and at the same time provides a declaration that there are no conflicts of interest for the key members of the procurement team including the Requisitioner.
- Significant detailed evaluation criteria were established for both Solution and Deployment RFPs that included weighting.
- External consultants relied on by SaskPower to assist in establishing the evaluation criteria and subsequently providing advice during the evaluations were specifically excluded from bidding on the RFPs for Solution and Deployment.
- The RFPs were issued using MERX. For the Solution RFP, it was issued only to the six successful vendors from the RFQ process, as noted above.
- Questions raised by proponents were addressed to the Purchasing Department who then requested answers and or clarifications from Legal or the Business unit, as required, and provided the answers to all proponents by way of updates on the MERX system.
- Proposals received were stamped upon receipt and some proposals were excluded from review due to being received after the RFP closing date.
- RFP openings were held and attended by Purchasing, Internal Audit and the respective Requisitioners.
- Evaluation of stage 1 was based on established criteria.
- Presentations were held for stage 2 evaluations that included demonstrations from the short list of vendors and were attended by both the Purchasing Department (not for the full duration) and the evaluation committees, which include the Requisitioner.
- Evaluation committees provided Purchasing with evaluation summaries at the end of both Stage 1 and Stage 2 of the evaluations with recommendations for a short list of vendors and the final recommended vendor, respectively.
- The Legal Department was not responsible for the resulting contracts but was consulted to review key legal terms within the final MSAs for each of Sensus and Grid One, the successful vendors for the Solution and Deployment procurements, respectively.

With respect to instances that were specifically identified where SaskPower was not in compliance with the Purchasing Policy & Procedures document in relation to the RFP process, we note the following:

- The Deployment RFP opening was also attended by Enspiria. As noted in the table above, the Purchasing Policy & Procedures state "No Consultants or Contractors may attend the RFP opening."
- The Purchasing Department was unable to provide documentary evidence that the Purchasing Supervisor approved the selected vendor for the Solution procurement process. As they no longer work for SaskPower, we were unable to confirm with them directly. However, other approvals and communications regarding the selection within SaskPower were noted.
- We were advised by the Purchasing Department that a contract award for the Solution stream of the AMI Program procurement was not announced to all Proponents and therefore a debriefing was not conducted for this RFP process. Purchasing also advised that the announcement was

initially postponed by the Business Unit until SOW2 (which was for the bulk of the meters purchased) was negotiated. Subsequent to SOW2 being signed in December 2013, the contract award was still not announced to the unsuccessful proponents.

With respect to the above noted instances of non-compliance, we note that they are procedural in nature and therefore would appear to have little or no impact on the issues that led to the removal of the smart meters in July 2014.

5. Evaluation and Selection Process

Further to the requirements noted above in the RFP section to perform evaluations on the bidders and short listed vendors, the Purchasing Policy & Procedures document provides the following guidance with respect to evaluation committees.

Procedure (Extract from 2007 SaskPower Purchasing Policy & Procedures)
The mandatory requirements and evaluation criteria used depend upon the specific nature of the purchase. Generally, they will address: 1. Compliance with contractual terms and conditions; 2. The technical merits of the goods or services; 3. The capability of the vendor to fulfil the requirement, including: technical and management competence; financial viability; relevant skills; experience; and availability of key personnel; 4. Life-cycle costs; 5. The risks or constraints associated with accepting the tender, proposal or quotation; and 6. Any wider benefits to SaskPower such as Saskatchewan or Aboriginal employment opportunities and environmental considerations.
Generally, at least two people must be involved in the evaluation process. However, in circumstances where only one evaluator is available, the evaluator must make every effort to have an independent review of the evaluation results. Evaluation Committees should be used for all complex or higher dollar value purchases For example, all Strategic Vendor Alliances must be established using an Evaluation Committee.
Membership - An evaluation committee must include staff with the right mix of knowledge and skills. The committee must be able to fully consider the proposals or quotations, plus the identification and assessment of the risks associated with the purchase.

With respect to our findings for the above noted procedures that were complied with for both the Solution and Deployment procurements, we also note the following:

- Extensive evaluation criteria were established ahead of the procurement process commencing to evaluate multiple areas of experience of the bidders including specific technical expertise and offerings, experience in the AMI industry, Aboriginal employment, and compliance with the expected contract terms and conditions, among numerous others.
- Separate evaluation committees were established for Solution and Deployment that included eight voting members each and included individuals from multiple business units, functional areas and specialists in meter hardware and installations from both SaskPower and SaskEnergy.
- Additionally, more than 30 other employees and subject matter experts were identified for each procurement stream as being able to assist or provide information or guidance throughout the evaluation process.
- No external consultants were made official committee members.
- Evaluation criteria were provided weighting based on importance of the criteria and consensus scores were reached for each criterion within each evaluation committee.

With respect to areas where compliance was either not noted, or instances that were specifically identified where SaskPower was not in compliance with the Purchasing Policy & Procedures document in relation to evaluation committees, we note the following:

- Interviewees from the evaluation committees noted that they were added to the committee after the evaluation criteria had been established and therefore they had no direct influence on establishing the evaluation criteria.

With respect to the above noted instance of non-compliance, we note that it was procedural in nature and therefore would appear to have no impact on the issues that led to the removal of the smart meters in July 2014.

6. Due Diligence and Risk Assessment Processes

Further to the requirements noted above in the RFP section to perform evaluations on the bidders and short listed vendors, the Purchasing Policy & Procedures document provides the following guidance with respect to due diligence and risk assessment processes:

Role	*Procedure (Extract from 2007 SaskPower Purchasing Policy & Procedures)*
Legal Dept.	The Legal Department's role in the purchasing process includes assisting in the management of legal and business risk.
Internal Audit	The role of the Internal Auditor's Department includes determining whether the risk management, control and governance processes related to SaskPower's purchasing activities are adequate and function to ensure goods and services are purchased economically, used efficiently and effectively and adequately protected.
Risk Management and Insurance Dept.	The Risk Management and Insurance Department advises the Purchasing Department, the Requisitioner and the Legal Department on the types and limits of insurance coverage a vendor must have to adequately cover the potential cost of damage and losses that the vendor causes during the course of a contract. In addition, the Risk Management and Insurance Department ensures that vendors provide SaskPower with adequate proof that they have appropriate insurance coverage.

With respect to our findings for the above noted procedures that were complied with for both the Solution and Deployment procurements, we also note the following:

- Throughout the procurement and contract management periods, SaskPower performed the following due diligence:
  - Requested within the RFP that all proponents provide information as to any current litigation or other legal proceedings that would impact on the resulting contract;
  - During negotiations with Sensus, requested and reviewed financial statements and conducted financial analysis, including review of contingent liabilities which would identify litigation claims of a material nature to the company;
  - Upon discovery of the claim by the ex-employee, SaskPower again requested from Sensus a confirmation that there were no specific current legal claims against them that would impact on their ability to perform the contract; and
  - Upon discovery of the PECO incidents, requested a confirmation from Sensus that the meters used in PECO, which were identical to those used in the Hanley field test and we were

advised were physically identical to the meters eventually installed in 105,000 Saskatchewan residences, were free from the risk of catastrophic failure.

- SaskPower considered the AMI program to be high risk as evidenced by the areas discussed above, namely the preparation of the AMI Business Case, the procurement governance structure, the detailed RFQ and RFP processes and the extensive evaluations performed on each procurement stream.
- Insurance coverage was addressed within the Deployment contract in relation to general liability insurance for access to customer property and for vehicle insurance, as required for mass mobility of installers. Insurance coverage was not addressed within the Solution contract.

With respect to areas where compliance was not noted, or instances that were specifically identified where SaskPower was not in compliance with the Purchasing Policy & Procedures, we note the following:

- The role of Risk Management was not clearly assigned and as such, a sufficient risk assessment that included identification of the risk of catastrophic meter failure and ongoing risk monitoring which would have prompted a re-evaluation of the risk did not occur. This includes the role of Internal Audit in periodically reviewing a higher risk procurement to determine whether sufficient risk management procedures were being undertaken.
- Although the AMI program was considered to be higher risk, certain good practice procurement activities did not occur, such as aspects of due diligence on Sensus in relation to present and past litigations, and obtaining independent corroboration of representations from Sensus as related to the PECO event.

These findings have been brought forward and recommendations provided.

7. Smart Meter Specification, Technical Standards and Testing

We expected that the Solution RFP would contain detailed specifications with respect to standards and specifications. We found that the Appendix F of the Solution RFP contained certain requirements that each vendor had to meet covering smart meter standards and specifications from Measurement Canada, the Canadian Standards Association, the Institute of Electrical and Electronics Engineers ("IEEE") and the American National Standards Institute ("ANSI"). There was no Underwriters Laboratory ("UL") safety standard in place for residential meters at the time of the procurement activity or subsequently. We understand from SaskPower that UL is currently working to develop a safety standard applicable to smart meters. We have not formed a view as to the appropriateness of these standards as this is outside the scope of our work, but understand that these standards were referenced based on appropriate SaskPower input. As such, we have no reason to believe that these are not the correct standards.

We expected that SaskPower would have a process to satisfy themselves that the meters were tested to meet relevant standards (e.g. electrical tests to handle current as designed and able to withstand certain voltages), such as ANSI environmental standards to be operated in certain environmental conditions (e.g. high humidity, direct rain and other conditions consistent with conditions in Saskatchewan). There was a series of approximately 30 to 40 different tests that were performed as part of confirming that ANSI requirements (e.g. electrical tests and environmental tests) were met for all proposed meters, including the Sensus meter. We noted that:

- Certain tests were undertaken to ensure the meters achieved the standards;
- During the RFP evaluation process, SaskPower relied upon vendors to provide supporting documentation to demonstrate that their meters passed these tests. This documentation was reviewed as part of the RFP evaluation and SaskPower engaged third parties to assist in the review. Sensus and the other proponents provided evidence of compliance with these standards

in the form of certification of previously performed tests and testing performed specifically for SaskPower's requirements.

- During the Stage 2 evaluation process, vendors came on-site for two days of presentations and interviews during which a series of technical questions were asked including failure rates of the meters on both the electric and natural gas side. Reference checks with current customers were also conducted on the proponents. SaskPower did not hold in-depth discussions with other utilities with regards to their testing regimes.
- Once the Solution vendor was selected, First Article Testing occurred. This required Sensus to provide a next to production model sample of meters. SaskPower verified the accuracy of the meter through independent third party testing. SaskPower also conducted some environmental testing in their own laboratories, verified that meters were programmed properly (i.e. software must be programmed according to SaskPower requirements) and tested the operation of the remote disconnect function (a requirement from the RFP).
- SaskPower separately tested the meters to a wider range of temperatures (i.e. -50 plus +40) than necessary, and where the standard required the meter to operate in winds up to 100kph, SaskPower tested the meters in winds up to 160kph. Testing requirements were included as part of the appendices of the RFP and were specified for both residential and commercial meters.
- We understand that the Sensus meters passed First Article Testing and no catastrophic failures occurred.
- First Article Testing did not include life-cycle testing as it takes a long time (6—8 months) to complete this type of test. This testing was not recommended by Enspiria as it was part of the ANSI testing performed that was evaluated during the RFP process. SaskPower reviewed Sensus failure testing performed (by ANSI) to ensure the meters met a minimum service life of thirty years and also tested the accuracy and operation of the disconnect switch.
- SaskPower relied upon the expertise of its external consultants with regards to the specifications and testing regimes used for the AMI program.
- During deployment, Sensus delivered meters and upon receipt of the meters, SaskPower conducted sample testing, such as configuration checks, checking the disconnect switch, and checking the accuracy of the meters. Once each shipment passed, it was removed from quarantine and added to deployment inventory. Sample tests were done on each and every shipment, where 3% of meters were randomly selected for testing. These tests areas were less onerous than the First Article Testing. Following review of the PECO incident, the random test sample size was increased to 5% of every delivery.
- SaskPower designed and executed a Field Test Acceptance or Pilot process which involved installing meters on 400 houses. The Field Acceptance Testing in Hanley was on the version 3.2 meter as it was the only meter that was approved at the time by Measurement Canada. SaskPower waited for the version 3.3 meter for the full roll-out as it had increased functionality and data (messaging system) and the 3.2 version could not meet SaskPower's data requirements (i.e. voltage information and alarms).
- Hanley was a geographic location that offered a good location with good cell coverage and a distribution of customers that was representative of the province. Hanley was selected over other locations initially proposed and was decided with Ministerial input.
- Sensus meters passed the Field Acceptance Test with no signs of catastrophic failure identified despite a tornado passing through Hanley during the test.

- We were advised by both SaskPower and Sensus that there was no material difference in physical design between the Sensus 3.2 and Sensus 3.3 meters, with the only differences being modifications to firmware and the enablement of the additional heat sensor. We understand technical specifications of these meters will be addressed by the engineering review.
- Testing then progressed to the Network Acceptance Test stage on approximately 1,000 meters and then to System Acceptance Tests on approximately 14,000 meters. Again, the Network and System Acceptance Tests were successfully completed without any signs of catastrophic meter failures.

Assessing the extent and nature of testing performed is outside the scope of our report, but from a procurement perspective we can conclude that SaskPower had designed and executed a detailed testing program.

We expected appropriate responses to information that became available during the installation period:

- The PECO metering incident became known during the Hanley field tests. We were advised that PECO was unwilling to make significant information available about the root cause of the issue. SaskPower and Enspiria attempted to contact PECO, but they were unable to obtain confirmation on the cause of the failures. The only information that they did obtain suggested that the fires were caused by "hot sockets". SaskPower issued a formal letter seeking assurance that the Sensus Meter was safe to operate and did not pose any immediate or future risk of catastrophic meter failure. Sensus responded with confirmation of this.
- Based on the incidents that occurred in PECO, when the Hanley Field Acceptance Test was completed, SaskPower performed a preliminary review of all 400 meters that were removed for signs of possible catastrophic failure (i.e. burning or melting) as well as additional detailed testing on 50 of these meters in their own laboratories to detect any early signs of catastrophic failure. We were advised that no signs of catastrophic failure were detected.
- The response to the PECO incident led to the establishment of a number of additional controls to manage risk once the concern of catastrophic failures came to light. These included:
  - The provision of an assurance letter from Sensus to mitigate contract risk;
  - Additional protocols and training to manage installation and detection of faulty sockets;
  - Enablement of a temperature sensor on the smart meters prior to full roll out; and
  - Removal of Sensus smart meters from residential locations in Hanley (pilot test area), which were examined further in a lab for signs of failure.

With respect to areas where compliance was either not noted, or instances that were specifically identified where SaskPower was not in compliance with the Purchasing Policy & Procedures, we note the following:

- After learning of the fires at PECO, SaskPower did not re-evaluate the risk of the Sensus smart meters which may have led to additional rigorous tests to attempt to identify the basis of the failure when PECO chose not to inform them of their findings.
- Although SaskPower obtained legal representation from Sensus regarding current litigation that could impact the roll-out, good practice would have expected that additional due diligence would be performed to determine whether there were any claims to be aware of in the period leading up to date (e.g. 3 – 5 years), and to obtain independent corroboration of the claims made by Sensus.

These issues have been brought forward as findings and associated recommendations provided.

8. Contract Terms Relating to Performance Standards

The Legal Department was involved in a review of MSA drafts and utilized the advice of a third party law firm where it was deemed necessary. We are aware that SaskPower instituted additional contract terms with Sensus to provide further protection to SaskPower as a result of PECO. The detailed review of the legal contracts and other legal mechanisms was performed by another professional services firm engaged by CIC.

Areas of Concern/Non-Compliance

In reviewing SaskPower's Purchasing Policy & Procedures document and assessing the AMI program procurement compliance with them, we identified two key areas of concern.

1. Catastrophic Meter Failure Was Not Identified as a Risk

Issue

During our review, we noted that the risk of catastrophic meter failure (e.g. a meter that causes damage to the property on which it is installed) was not identified and/or re-evaluated as potential risk indicators were identified both during the procurement activities and during the resulting contract periods.

Discussion

The primary issue of catastrophic meter failures which prompted the AMI program to be halted was not identified as an initial program risk. When additional information about smart meter fires from other sources came to light, the risk of catastrophic meter failures did not prompt an independent re-evaluation of the risk related to Sensus smart meters. An escalation of the risk assessment could have prompted additional investigation, testing, and either closer monitoring of installed meters or a pause to the roll-out of smart meters until issues were better understood.

Although we cannot determine whether any actions could have prevented the smart meter fires from occurring in Saskatchewan, consideration of catastrophic meter failures should have occurred at the outset of the program. In light of the fires at the Philadelphia Electric Company ("PECO") in August 2012 which prompted PECO to halt their smart meter program, SaskPower responded with legal risk mitigation by way of contract terms and representation from Sensus, and certain actions based on limited information provided by PECO, but did not then investigate the risk of catastrophic meter failure and the impact on customer safety to the extent undertaken once the fires occurred in Saskatchewan.

Recommendation 1

The risk assessment process should be strengthened in the Purchasing Policy & Procedures to clearly require a more thorough consideration, documentation and evaluation of risks as potential risk indicators are identified during the development of a procurement strategy, as part of project planning, and monitored for new or changing risks during the period of the contract.

2. Unclear Roles & Responsibilities in Purchasing Policy & Procedures

Issue

During our review, we noted there was a lack of clarity in roles and responsibilities defined in the Purchasing Policy & Procedures. In particular, the Purchasing Policy & Procedures document does not clearly outline the significant roles and responsibilities for Risk Management and Safety Management. We also noted that the role of strategic procurement was not suitably fulfilled.

Discussion

The AMI program has spanned three years so far and involved many different individuals (both internally and externally) fulfilling roles at various stages of the program. This adds complexity to the aspect of fulfilling roles and responsibilities that were defined in the 2007 Purchasing Policy &

Procedures. While Risk Management, Legal, the "Requisitioner" (Business Unit), Internal Audit and Purchasing all had a part to play in risk management, their specific roles in managing risk and how they work together (especially for a higher risk project) were not clearly defined in the 2007 Purchasing Policy & Procedures.

Roles and responsibilities for all parties should be clearly articulated and further outlined in the procedures as they relate to risk, safety and due diligence to help ensure this is part of the Program Management's responsibilities and ensure there is coverage at all times during a major, high risk procurement and contract process.

This also extends to having better clarity around a single point of responsibility for the identification of safety risks and requirements associated with procurement, to bring together inputs and findings of all the roles and responsibilities and evaluate all these risks during the procurement process and subsequently throughout the lifetime of a contract.

Further, a specific gap in the performance of the Procurement role, as defined in the Purchasing Policy, was to provide strategic procurement advice to the team. In this case, the role was filled by an external industry smart meter specialist, and not a procurement specialist. While this is not uncommon for these types of programs, there is risk involved when the majority of procurement advice is provided by external individuals, as this can result in a narrow focus limited to their specialty, without the independence and challenge that an experienced internal procurement specialist advisor would bring. Involving a procurement specialist to provide strategic advice in addition to insights from industry specialists could be expected and can enhance risk management while bringing forward some of the concepts outlined in the good practices section.

a) Risk Management

The Purchasing Policy & Procedures defines a Risk Management function for purchasing. However, it is described mainly with regard to ensuring appropriate insurance coverage. There is no clearly defined role and responsibility for performing a risk assessment on the vendor or the goods or services being purchased.

Clarifying the specific roles and responsibilities in relation to Risk Management is an area for improvement, and we outline a number of good practices in Section 6 that should also be considered to further enhance the Risk Management role.

Additionally, with respect to Risk Management and mitigation practices surrounding due diligence, we observed that the role of the Legal Department and the outsourced law firm was to support the Business Units, when required, and their role with respect to performing due diligence was subject to specific requests. In a number of instances, as outlined in our timeline in Appendices 1 and 2, the Legal Department and external legal counsel were involved in discussions with Sensus aimed at mitigating risks based on information SaskPower became aware of during the contract management period; namely the complaint raised by the former employee of Sensus and the PECO incidents. With more specific responsibility for risk management and safety being assigned, the risk mitigation procedures undertaken here may also have then included product safety.

b) Alignment of Safety Management to Purchasing Policy & Procedures

The Purchasing Policy & Procedures identify certain requirements in regards to safety management, but primarily from the perspective of worker safety. The Purchasing Policy & Procedures document does not identify the role or responsibility for specifically identifying and managing risks regarding the safety of goods, equipment and materials purchased during the procurement process.

Though we observed evidence that people and behavioural safety was considered throughout the procurement and contract management process, there was an inconsistency observed between how SaskPower effectively addressed the product safety incidents that occurred in Saskatchewan in 2014 and their response to the product safety incidents that they became aware of in 2012 following the PECO incidents.

Clarifying the specific responsibilities and steps to assess and manage both people safety and product safety risks through the procurement and contract management process is an area for improvement and we outline a number of good practices in Section 6 that should also be considered to further enhance safety management within SaskPower.

In performing the AMI procurement activities, it was noted that SaskPower engineers were ensuring that safety standards were represented in the smart meters being purchased through technical requirements in the RFP including certain regulatory standards. People safety was addressed through training and ensuring qualifications of installers. We understand that the Safety Department was not specifically involved in this procurement or the contract management activities until the fires in Saskatchewan occurred.

Recommendation 2

Roles and responsibilities regarding Risk Management, encompassing each enterprise risk category, and specifically safety risk, should be clearly identified in the Purchasing Policy & Procedures, and assigned at the outset of the project for the duration of the procurement and subsequent contract.

Recommendation 3

A specific role should be defined and assigned in a Complex Procurement that provides for each of the following:

a. strategic procurement advice,
b. identification of all risks and requirements associated with the procurement of higher risk goods and services, and then
c. support to the contract owner in managing vendor performance and risk for the duration of the contract.

Recommendation 4

A single point of accountability should be assigned in a Complex Procurement that would bring together the inputs and findings of all of these individual roles and responsibilities, and would ensure that risks are evaluated as a whole during the procurement process and subsequently throughout the lifetime of a contract.

It cannot be determined whether addressing these gaps could have potentially reduced or minimized the impact of the incidents. However, they may have helped play a role in the assessment and management of risk during the AMI program.

B. Contract and Vendor Management (Post-Contract)

As a result of our review of contract and vendor management processes, we provide the following observations:

1. Contract Management and Administration

- The contracts established for the Solution and Deployment streams of the AMI program included well documented and detailed Master Services Agreements ("MSA") and Statements of Work ("SOW") that we observed and were advised were the result of lengthy negotiations between SaskPower and the winning Vendors.

- The overall contracting structure included setting up MSAs for both the Solution and Deployment streams as the primary over-arching agreement with each Vendor. SOWs were then used within the MSAs to address specific areas of work for the different phases within each overall contract. Through the SOWs, SaskPower employed a multi-staged rollout. SOWs were carefully prepared to consider certain issues such as equipment delivery risk and missing specifications on meters and covered various stages of the overall contract process. Refer to Appendices 1 and 2 of this report for timing of the MSAs and SOWs.
- Specifically, in regards to the Deployment contract, we noted the following:
  - SaskPower and Grid One understood the importance of using Competent Workers (rather than Qualified Electrical Workers) as a means to reduce the overall installation labour costs. We were advised by interviewees that this practice had been previously used in other North American meter deployments;
  - Formal exemption requests were filed separately by both SaskPower and Grid One with the Saskatchewan Ministry of Labour Relations and Workplace Safety to allow Competent Workers to perform meter installations;
  - The Ministry helped to ensure people were appropriately qualified by defining conditions for the exemptions and subsequently monitoring the program which included challenging the exemption in December of 2013 and subsequently requiring revisions to the training provided to the Competent Workers; and
  - When the Grid One exemption was rescinded in February 2014 as a result of the workers being outsourced from Manpower rather than direct employees of Grid One, SaskPower took action to hire the same installers as SaskPower employees where they could work under SaskPower's exemption and also consequently become temporary members of the International Brotherhood of Electrical Workers union.

2. Program Management Execution

- Project management for AMI was executed through the structured organization of the SDR program, as would be expected for a large capital project of this nature; reporting structures were documented in organization charts.
- Detailed reporting requirements were outlined for status reports at regular frequencies.
- Most of the project management execution was done with limited evidence of strategic tracking of procurement related performance measurements or the engagement of strategic procurement specialists.

3. Program Risk Management

- A program issues log was maintained (i.e. AMI Integrated Risk Log), which tracked issues/concerns in regards to the program/vendors.
- Key testing milestones were established, which allowed for an incremental approach to installing meters during the testing phases (Field Test, Network Acceptance Test, System Acceptance Test).
- Sample testing was been applied to all product shipments prior to clearing each shipment for use in general deployment.
- The PECO incident was considered by SaskPower management, which led to the establishment of a number of additional controls to manage risk once the concern of catastrophic failures came to light. These included:

1. The provision of an assurance letter from Sensus to mitigate contract risk;
2. Additional protocols and training to manage installation and detection of potentially faulty sockets;
3. Enablement of an additional temperature sensor on the smart meters prior to full roll out; and
4. Removal of Sensus smart meters from residential locations in Hanley (pilot test area), where the meters were subsequently reviewed for signs of failure.
5. Increasing the sample size of meters randomly tested on receipt from 3% to 5%.

Based on the significance of the PECO fires to the AMI program, it would be reasonable to expect that SaskPower would obtain independent corroboration of the assurance letter provided by Sensus. We also expected that SaskPower would have performed an independent re-evaluation of the risk assessment of the smart meters. These findings and associated Recommendation 1 is recorded as our primary point of concern coming out of this review.

6 Comparison to Good Practice

It should be noted that there is no common industry-wide standard that is widely agreed upon to determine "good" or "expected" practices when it comes to comparing due diligence, procurement and contracting processes, but there are a number of practices that can be 'reasonably expected'. This was the focus and aim of our review, as it relates to other Crown Corporations in the province, and in utilities across Canada and the US. PwC used a broad team of global and North American industry specialists to help provide an objective view to what should have been "reasonably expected" based on experience with other comparable AMI programs. It should also be noted that discussions were held with other Crown Corporations during this review to further validate that these could be seen to be expected practices as they are already being employed by other Crown Corporations.

As noted in Section 5 of this report, we would consider some of the procurement activities carried out by SaskPower as good practices, such as the following:

- A two-stage procurement process, including an initial Request for Qualification (RFQ), was used to identify capable AMI Solution providers to accommodate a more efficient and effective Request for Proposal (RFP) process.
- A well thought through sourcing strategy (i.e. formal plan to minimize risk and maximize value for money) was in place to identify risks and opportunities. Although the Solution contract was awarded to a single provider, Sensus, this was actually a multi-source strategy and contract award, meaning the RFP requested that the vendors provide 2 options in their response:
    1. 100% of the meters supplied directly
    2. 80% of the meters supplied by the primary vendor and 20% supplied by the vendor but from a different manufacturer

  This strategy was intended to hedge against supply continuity risks. Sensus was the only provider who responded with the multi-source option, as they provided both options. The original contract was for the 100% Sensus meters, but after the PECO incident, SaskPower changed the contract to move to the 80/20 split (using Landis+Gyr meters for the other 20%).

The review also identified a number of areas where there are opportunities for improvement when compared against good practice. It is important to note that while it cannot be determined whether the application of these good practices could have potentially reduced or minimized the impact of the incidents, they could have helped play a role in the assessment and management of risk during the AMI program.

1. Complex Procurement Management

Procurement needs can be simple and routine (as with the purchase of office equipment) or complex when procuring high-risk equipment or services such as with the AMI program (this is referred to as "Complex Procurement"). A good practice is to have a well-defined policy, process and guidelines for both routine procurement and Complex Procurement needs with clear steps and controls for Procurement to take for handling Complex Procurement. Good practice involves a differentiated process, with increased controls and levels of specialist support to handle Complex Procurement needs, based on the level of risk associated with the equipment or service, supported by procurement specialists that are familiar with managing end-to-end risks associated with high impact suppliers such as Sensus. SaskPower does not have a separate Complex Procurement management process, something that we see is becoming good practice in other similar organizations. (Note: While it might be argued that meters are relatively low risk items, our comments reflect the fact that the AMI program was a major capital

program that represented a major change to the corporation, identification of a vendor who might be working with SaskPower for up to 30 years, and installation of new technology meters on customer sites). Another characteristic of Complex Procurement would be closer integration with capital program management and a dedicated representative from the Procurement team that has experience in capital procurement.

An important example from the review relates to the level of rigour and management of vendor due diligence. Good practice in Complex Procurement with long term agreements would suggest that a more robust due diligence be performed with respect to the vendor organization when certain criteria are met, especially in situations where they are not already well known to SaskPower or the procurement is identified as a higher risk or a Complex Procurement need.

As identified in Section 5 of our report, a number of due diligence procedures were performed on the Solution and Deployment vendors. That said, given the high risk nature of the AMI program, certain additional independent due diligence procedures could have been performed by SaskPower (but were not), such as the following:

- Asking for historical (e.g. last 5 years) information on any litigation or lawsuits (in addition to current information which was requested) that relate to the vendor or its products and services.
- Close coordination, ownership and oversight from Procurement to manage the entire due diligence process. A number of steps were performed over the course of the AMI program to further develop the risk profile (e.g. financial analysis, legal review, market reports following the PECO incident, analysis of correspondence from Sensus) which appeared to occur in siloes and was not coordinated by Procurement, presenting a risk that key pieces of information were not considered together or holistically to understand risk at the enterprise level.
- Independent due diligence in certain cases to corroborate representations from vendors. There was an apparent reliance on first party confirmation (validation from Vendors) to provide information that would ideally be performed through independent due diligence steps. Specific examples of this include asking the bid participants to provide information on any current lawsuits and asking Sensus to provide letters of assurance after learning of the employee claim and the PECO incident. We would have expected additional independent validation to corroborate the vendor representations in this case.

  During our market scan, we noted examples of other crown corporations that requested both current and historical lawsuits and claims (e.g. claims within the past five years). In addition, we noted that they also perform independent legal due diligence checks on major programs that are considered to be high risk, including actual site visits to the vendor's manufacturing facilities and quality assurance centres. When due diligence concerns are identified, the vendor is asked what measures they have taken to prevent the situation from occurring again.

  With respect to performing external due diligence on Vendors, there are many firms within North America that can provide a single point of reference for such due diligence within one week, for costs that are relatively low in comparison to the value of multi-year contracts such as those entered into by SaskPower within the AMI program.

  In addition, there are certain searches that may be performed that could highlight potential vendor issues. For example, the following searches could be conducted:

  - Litigation searches – a small number of databases provide a large majority of the information for litigation documents for all levels of Canadian and U.S. courts;
  - Negative Press Searches – databases that search most Canadian and U.S. newspapers for press for articles relating to specific companies or individuals;

- Bankruptcy Searches – searching public record databases in Canada and U.S.;
- Sanctions Search – a database that includes the U.S. Office of Foreign Asset Control that identifies any foreign sanctions and persons of interest that may have significant political risk; and
- Corporate Searches – single point of reference for Canadian searches that includes federal and provincial jurisdictions. U.S. searches require more than one point of searching depending on the States and Cities required.

Recommendation to Good Practice 1

SaskPower should consider enhancing their Purchasing Policy & Procedures to provide guidelines for identifying the risk level of Procurement and clear steps for how to manage both routine and Complex Procurement needs. The guidelines can help identify what type of procurement would typically be documented and considerations could include higher risk goods or services, dollar size of procurement, and use of multiple providers. The guidelines should also provide information on the additional steps around due diligence, vendor management and contract management for Complex Procurement needs and the associated roles and responsibilities to complete these steps.

2. Process Safety Management & Safeguards

While it is evident there is a strong safety culture within SaskPower and safety is an important priority, an opportunity for improvement involves integrating Process Safety Management ("PSM") principles into the procurement and contract management processes. An observation was that Process Safety (meaning the overarching enterprise-wide footprint of the infrastructure of facilities, information networks and customer premise sites) was not considered to the level that it was for an employee or contractor perspective. Adoption of PSM may help to identify and manage risks such as those encountered on the AMI project in the future. This is increasingly being considered good practice and is being adopted by organizations during a major upgrade in facilities, technology or equipment.

It should be noted that SaskPower is currently developing in-house Process Safety Management capabilities, such as the recent hiring of two engineers focused on enhancing Process Safety Management.

Recommendation to Good Practice 2

SaskPower should consider formalizing a Process Safety Management program and assigning responsibility for the program and integrating this program with in the procurement and contract management policies, procedures and processes.

3. Vendor and Contract Management Capabilities to Manage Risk

During the review it was confirmed that SaskPower does not have documented processes and procedures for managing its vendors and their performance. This capability is referred to as "vendor management". Good practice vendor management involves grouping vendors based on the level of their strategic importance (high risk and high impact) to SaskPower. Performance of vendors against multiple contracts is then managed by developing scorecards based on mutually agreed upon performance measures. Governance structures are set up to manage vendor performance based on their strategic importance to SaskPower. Roles and responsibilities around contract management were not clearly defined or consistently understood by many of the individuals involved in the AMI program.

It should be noted that there was a single contract owner (within the Information Technology group), and while a single owner is in line with good practice, the owner should be a fully dedicated vendor manager role for a program of this complexity and risk. Overburdening one individual to have these responsibilities among others may dilute post-contract governance and controls and increase risks involved in the management of high impact suppliers.

We also observed there was no formal vendor performance scorecard in place for either managing Sensus or Grid One. We noted that there was an overarching AMI program scorecard (including the tracking of safety incidents and progress). Good practice would involve specific vendor scorecards with performance metrics on service, safety, cost, quality, innovation and risk.

A contract is the main tool to minimize risk exposure to the business. Vendor and contract management capabilities are the primary vehicles that can hold vendors accountable to the contract to help better anticipate and manage risks associated to high impact suppliers through the life of the contract. With a high risk program like AMI, the level of integration and partnership with a Solution provider (like Sensus) should be viewed as a strategic long term partnership, given its risk profile. This gap is recognized by the business (as it has also previously been identified during an independent procurement assessment) during the AMI program and was also a similar recommendation by an external specialist directly involved in the AMI program (around the time of the contract award to Sensus).

Recommendation to Good Practice 3

SaskPower should continue to build and enhance vendor and contract management capabilities and procedures – including assignment of a single contract owner responsible for vendor performance and a specific governance process for managing risk with high impact suppliers. This would also include the use of vendor performance scorecards that include metrics across service, safety, cost, quality, innovation and risk. The creation of a vendor and contract management specialist role can help provide expertise and insight for the business in managing strategic vendors, to better manage risk and deliver increase business value. It is also important to invest in training for the business on this capability as simply establishing some guidelines, tools or scorecards is not enough. Appropriate training should be provided across the business so everyone that has a role to play in vendor and contract management is clear on what their role is and what responsibilities they have to manage vendors and risk for SaskPower.

7 In Summary

SaskPower's Purchasing Policy & Procedures in place would be comparable to what we have observed in similar Crown Corporations and Power Utilities, and these were followed throughout the AMI program. SaskPower management treated the AMI program as a complex initiative and engaged specialist advisors to augment in-house capabilities. However, roles and responsibilities related to procurement were not clearly defined, fulfilled nor assigned for the management of enterprise risks relevant to procurement, and specifically for safety risks. In addition, some of the key activities that would be expected from a good practice perspective in Complex Procurement guidelines and steps to help handle a large, complex initiative were missed, such as sufficient due diligence.

During the smart meter roll-out period, SaskPower became aware of the risks associated with comparable failures in another jurisdiction and responded to address what it perceived to be the cause of the failures. However, their response did not address the real root cause of the failures, which suggests that the impact of the subsequent failures in Saskatchewan might have been mitigated if SaskPower had applied the same rigour to re-evaluate the risks in their own smart meter program as would have been expected had the incidents at PECO occurred in Saskatchewan. An escalation of the risk assessment could have prompted additional investigation, testing, and either closer monitoring of installed meters or a pause to the roll-out until the issues were better understood.

As a result of our procurement review, we identified two key findings for which we provide SaskPower four recommendations to be implemented to address these findings. We also identified three opportunities for SaskPower to move toward good practice for which we provide an additional three recommendations for SaskPower to consider.

Recommendations

We understand that SaskPower is currently in the process of enhancing their Purchasing Policy & Procedures, while renewing Procurement and Contract Management processes that will help modernize capabilities.

As part of this effort, we recommend that the key findings from this review be implemented in the enhancement program to help better manage risk:

1. The risk assessment process should be strengthened in the Purchasing Policy & Procedures to clearly require a more thorough consideration, documentation and evaluation of risks as potential risk indicators are identified during the development of a procurement strategy, as part of project planning, and monitored for new or changing risks during the period of the contract.
2. Roles and responsibilities regarding Risk Management, encompassing each enterprise risk category, and specifically safety risk, should be clearly identified in the Purchasing Policy & Procedures, and assigned at the outset of the project for the duration of the procurement and subsequent contract.
3. A specific role should be defined and assigned in a Complex Procurement that provides for each of the following:
    a. strategic procurement advice,
    b. identification of all risks and requirements associated with the procurement of higher risk goods and services, and then
    c. support to the contract owner in managing vendor performance and risk for the duration of the contract.

4. A single point of accountability should be assigned in a Complex Procurement that would bring together the inputs and findings of all of these individual roles and responsibilities, and would ensure that risks are evaluated as a whole during the procurement process and subsequently throughout the lifetime of a contract.

Recommendations to Good Practice

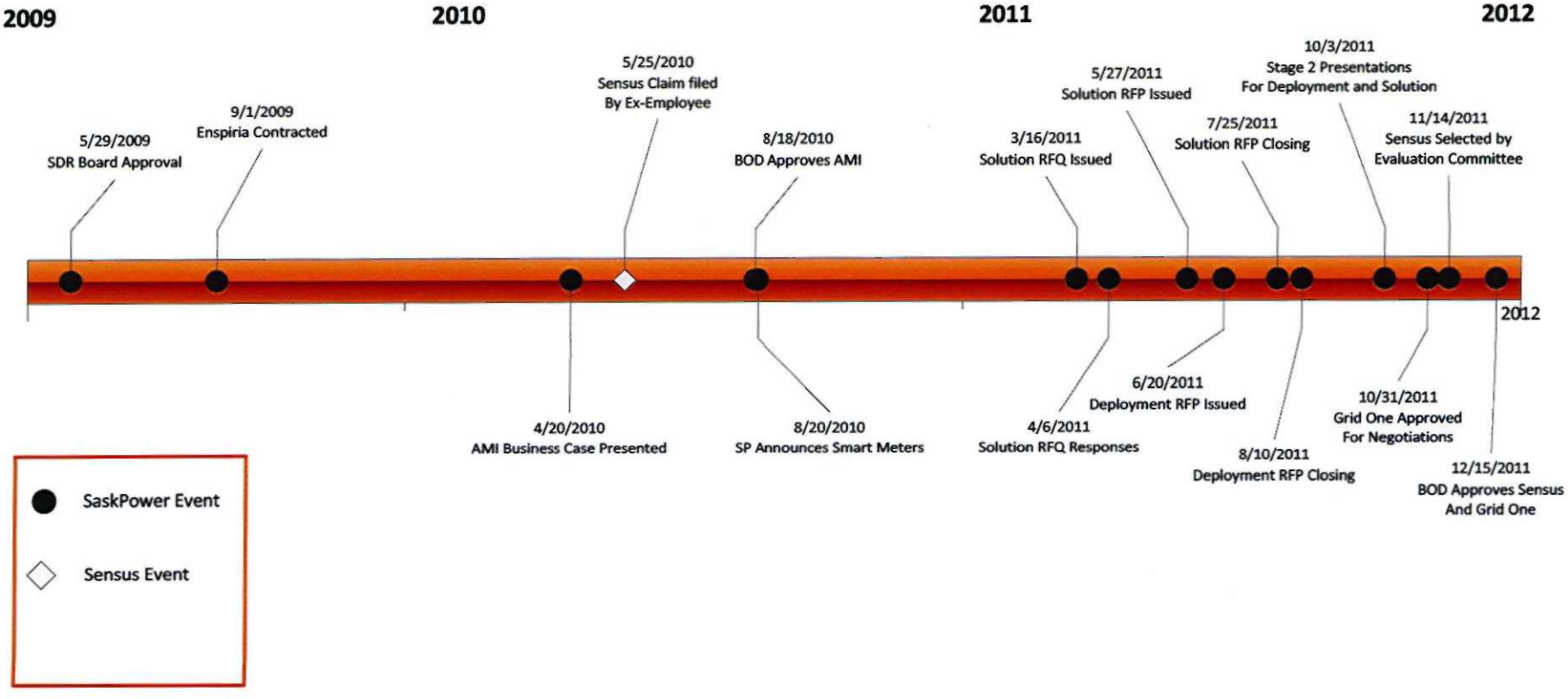
As part of this effort, we suggest that some of the key findings from this review be considered in the enhancement program to help move SaskPower toward good practice:

1. SaskPower should consider enhancing their Purchasing Policy & Procedures to provide guidelines for identifying the risk level of Procurement and steps for how to manage both routine and Complex Procurement needs. The guidelines can help identify what type of procurement would typically be documented and considerations could include higher risk goods or services, dollar size of procurement, and use of multiple providers. The guidelines should also provide information on the additional steps around due diligence for Complex Procurement needs and the associated roles and responsibilities to complete these steps.
2. SaskPower should consider formalizing a Process Safety Management program and assigning responsibility for the program and integrating this program with in the procurement and contract management policies, procedures and processes.
3. SaskPower should continue to enhance vendor and contract management capabilities and procedures – including assignment of a single contract owner responsible for vendor performance and a specific governance process for managing risk with high impact suppliers. This would also include the use of vendor performance scorecards that include metrics across service, safety, cost, quality, innovation and risk. The creation of a vendor and contract management specialist role can help provide expertise and insight for the business in managing strategic vendors, to better manage risk and deliver increase business value. It is also important to invest in training for the business on this capability as simply establishing some guidelines, tools or scorecards is not enough. Appropriate training should be provided across the business so everyone that has a role to play in vendor and contract management is clear on what their role is and what responsibilities they have to manage vendors and risk for SaskPower.

Appendix 1 – Timeline Charts

A. Procurement Timeline

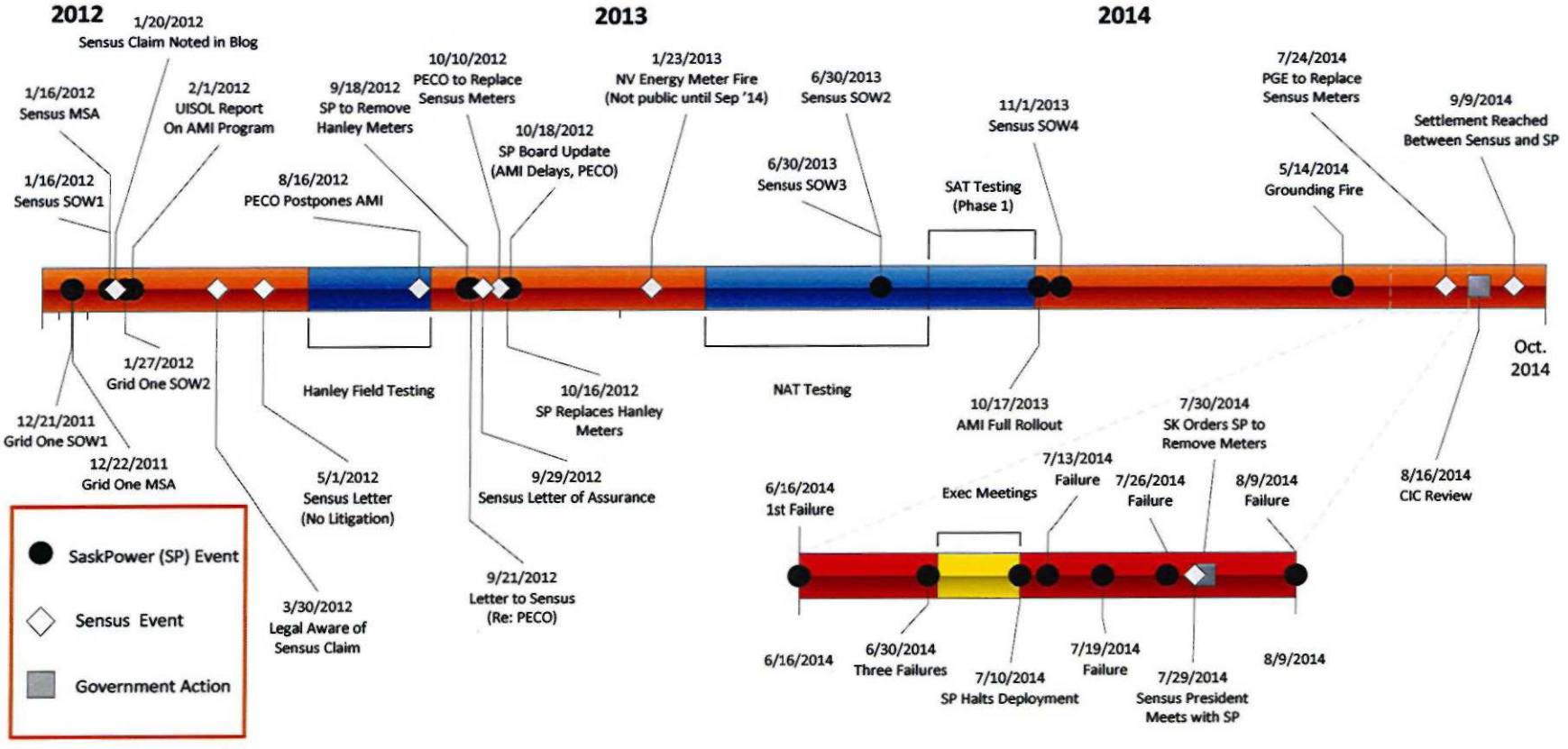
SaskPower AMI Program Procurement Timeline



Refer to Appendix 2 for description of key events and definition of acronyms in timeline.

B. Contract Management Timeline

SaskPower AMI Program
Contract Management Timeline



Refer to Appendix 2 for description of key events and definition of acronyms in timeline.

Appendix 2 – Timeline Details

#	Timeline	Event Date	End Date	Event Name	Description
1	Procurement	5/29/2009		SDR Board Approval	SaskPower Board approves Service Delivery Renewal (SDR) program
2	Procurement	9/1/2009		Enspiria Contracted	Enspiria contracted by SaskPower through Solvera to provide external consulting services in relation to the proposed AMI Program including identification of requirements for the AMI program for use in the business case, assistance with development of RFP criteria, and assistance with the RFP evaluations and ongoing consulting throughout the contract implementation.
3	Procurement	4/20/2010		AMI Business Case Presented	The AMI Business Case was first presented to the Executive April 20, 2010. Subsequent presentations were made to the Audit and Finance Committee on July, 28, 2010, and Board of Directors August 18, 2010.
4	Procurement	5/25/2010		Sensus Claim Filed by Ex-Employee	Legal claim filed against Sensus in US District Court of Alabama by a former employee. Employee claims he was wrongfully dismissed for raising concerns of smart meter fires that occurred in 2009. The article notes that the Alabama US Attorney's office declined to pursue the claim as Government funding, which was the key premise of the claim, was not received by the utility that allegedly experienced the fires.
5	Procurement	8/18/2010		BOD Approves AMI	Board of Directors approve staged implementation of an AMI Solution.
6	Procurement	8/20/2010		SaskPower announces smart meters	SaskPower announces $190 million plan to replace existing electric meters with smart meters. The project is expected to eliminate 95 traveling meter-reader employees. SaskPower anticipates achieving at least $463 million in operational savings over 20 years.
7	Procurement	3/16/2011		Solution RFQ Issued	Request For Qualifications (RFQ) issued to North American AMI marketplace for the AMI Solution. The RFQ detailed minimum expected requirements in relation to AMI deployment experience in North America.
8	Procurement	4/6/2011		Solution RFQ Responses	Eleven vendors submitted a response to the RFQ, with six being selected based on their experience in relation to the requirements. These vendors were subsequently invited to participate in the subsequent Request for Proposals (RFP) process.
9	Procurement	5/27/2011		Solution RFP Issued	Request for Proposals for the AMI Solution was issued to the six qualifying vendors from the RFQ process.
10	Procurement	6/17/2011		Deployment RFP Issued	Request for Proposals for the AMI Deployment was issued to twelve companies included in the proposed Vendor list.
11	Procurement	7/25/2011		Solution RFP closing	Final date to submit proposals for the AMI Solution RFP. Five proposals were received. Two of these vendors were subsequently selected after evaluation to advance to stage two evaluations.
12	Procurement	8/10/2011		Deployment RFP closing	Final date to Submit proposals for the AMI Deployment RFP. Proposals were received from five vendors. Four of these vendors were subsequently

#	Timeline	Event Date	End Date	Event Name	Description
					selected after evaluation to advance to stage two evaluations.
13	Procurement	10/3/2011	10/6/2011	Stage two evaluation presentations	Presentations for stage two evaluations for Solution and Deployment were held.
14	Procurement	10/31/2011		Grid One Approved for Negotiations	An individual from the Purchasing Department signed on behalf of the Purchasing Supervisor on October 31, 2011 to approve negotiations with Grid One, selected based on the stage two evaluation results.
15	Procurement	11/14/2011		Sensus Selected by Evaluation Committee	Evaluation committee signed off on results of stage two evaluation between November 14-30, 2011 and recommended Sensus as the winning vendor. No authorization by the Purchasing supervisor was noted in the files provided.
16	Procurement	12/15/2011		Board Approval of Sensus and Grid One	Sensus (for Solution) and Grid One (for Deployment) were recommended to, and approved by, SaskPower's Board of Directors as the preferred vendors.
17	Contract Management	12/21/2011		Grid One SOW1	Grid One Statement of Work, SOW1 (Endpoint Deployment) established as effective December 21, 2011. Signed by all parties between December 27, 2011 and January 6, 2012.
18	Contract Management	12/22/2011		Grid One MSA	Grid One Master Services Agreement established as effective December 22, 2011. Signed by SaskPower, SaskEnergy and Grid One between December 29, 2011 and January 6, 2012.
19	Contract Management	1/16/2012		Sensus MSA	Sensus Master Service Agreement signed between SaskPower, SaskEnergy and Sensus USA. It was signed by all parties between January 19, 2011 and January 27, 2012. The MSA was subsequently assigned by Sensus USA to Sensus Canada on January 19, 2012.
20	Contract Management	1/16/2012		Sensus SOW1	Sensus SOW 1 (AMI Solution Initial Configuration Planning and Testing) established as effective January 16, 2012. Signed by all parties between January 19, 2011 and January 27, 2012
21	Contract Management	1/20/2012		Sensus Claim Noted in Blog	A blog at stopsmartmeters.org identifies the claim made by an ex-employee of Sensus on May 25, 2010.
22	Contract Management	1/27/2012		Grid One SOW2	Grid One SOW2 (Endpoint Deployment) established as effective January 27, 2012. Signed by all parties between February 9, 2012 and February 28, 2012
23	Contract Management	2/1/2012		UISOL Report on AMI Program	UISOL engaged to evaluate SaskPower's AMI program. They recommended additional testing prior to deployment, which was adopted and increased attention to the project management role. In their view the original schedule did not allow for all of the necessary tests prior to full deployment. UISOL was subsequently contracted on March 21, 2012 to provide project management services for the AMI program.
24	Contract Management	3/30/2012		Legal Dept. aware of Sensus claim	Email between Legal Department staff that first identifies the May 25, 2010 claim against Sensus by an ex-employee. Some SaskPower employees advised that they were aware of this claim sometime after the MSA was signed with Sensus in January 2012, but could not provide an exact date.
25	Contract	5/15/2012		SaskPower	Sensus confirms to SaskPower by email that there are

#	Timeline	Event Date	End Date	Event Name	Description
	Management			Concerns with Sensus	no current legal claims against it that would materially adversely impact on its ability to meet its obligations under the MSA.
26	Contract Management	6/1/2012	8/24/2012	Hanley Field Test	Field Testing begins in Hanley, SK. The testing uses Sensus 3.2 version electric meters with 400 electric meters and 50 gas modules installed. These meters are an older version than those expected to be deployed.
27	Contract Management	8/16/2012		PECO Postpones AMI	Philadelphia Electric Company (PECO) announces the postponement of their smart meter program due to 14 incidents of overheating. PECO was using Sensus 3.2 version smart meters.
28	Contract Management	9/18/2012		SaskPower to Remove Hanley Meters	SaskPower Executives advised that they decided to remove the Sensus meters installed for the Hanley field test and replace with the original legacy meters, rather than leave them in place until the 3.3 version meters became available, as was the original plan. The meters were eventually removed on October 16 and 17, 2012.
29	Contract Management	9/21/2012		Letter to Sensus (Re: PECO)	SaskPower identifies their concerns in relation to media coverage of PECO's smart program, particularly with respect to Sensus meters and identified socket related issues. SaskPower formally requests written confirmation from Sensus that there are no intrinsic or inherent defects within the Sensus-Icon A Gen 3 Phase 2 meter product (the "3.2 version" meters).
30	Contract Management	9/29/2012		Sensus Letter of Assurance	Sensus response to SaskPower's concerns about PECO. Sensus provides assurance that the 3.2 version meters are free from issues that could cause catastrophic failure.
31	Contract Management	10/10/2012		PECO to replace Sensus meters.	PECO announces plans to replace almost 190,000 Sensus meters with Landis+Gyr meters.
32	Contract Management	10/16/2012	10/17/2012	SaskPower Replaces Hanley Meters	SaskPower executives advised that the removal of the 400 Sensus 3.2 version meters installed in Hanley, SK for the field test occurred over these two days. They were replaced with meters that were previously installed in Hanley prior to the field test.
33	Contract Management	10/18/2012		SaskPower Board Update (AMI Delays, PECO)	SaskPower Board meeting during which Management provided an update on AMI program delays and safety concerns. Sensus was delayed in providing 2,000 meters for the Network Acceptance Test. Fires occurred at PECO but it was not clear whether they were the result of the meters or the sockets. As a result of both of the above items, Management was initiating testing on Landis+Gyr Meters as an alternative supply.
34	Contract Management	1/23/2013		NV Energy Meter Fire	Report from the Nevada Department of Public Safety on an instance of fire in January 2013 possibly related to a Sensus smart meter. This report was not made public until September of 2014, subsequent to the July 2014 death of a Nevada resident in a house fire believed to be caused by a smart meter. The report notes that the cause of the January 2013 fire was not conclusive. It is understood that Enspiria had also provided consulting services to NV Energy.
35	Contract Management	3/1/2013	8/2/2013	NAT Testing	Network Acceptance Test using 3.3 version of Sensus meters. Approximately 2,000 meter installs were planned in Regina and surrounding area, but only

#	Timeline	Event Date	End Date	Event Name	Description
					1,001 electric meters and 149 gas meters were installed due to weather delays.
36	Contract Management	6/30/2013		Sensus SOW2	Sensus SOW2 (AMI System Completion) established as effective June 30, 2013. Signed by all parties between December 9, 2013 and December 20, 2013.
37	Contract Management	6/30/2013		Sensus SOW3	Sensus SOW3 (AMI Ongoing Support) established as effective June 30, 2013. Signed by all parties between December 9, 2013 and December 20, 2013.
38	Contract Management	8/2/2013	9/27/2013	SAT Testing (Phase 1)	Upon completion of the Network Acceptance Test, 14,000 additional version 3.3 Sensus meters were installed in the same area as the Network Acceptance Test. Exact starting date unknown.
39	Contract Management	10/17/2013		AMI Full Rollout	AMI program full rollout announced by SaskPower to begin as a result of successful SAT.
40	Contract Management	11/1/2013		Sensus SOW4	Sensus SOW4 (Landis+Gyr Meters) established as effective November 1, 2013. Signed by all parties between December 9, 2013 and December 20, 2013.
41	Contract Management	5/14/2014		Grounding Fire	Grounding issue causes fire at SaskPower customer residence. Cause of the issue was not related to smart meter as it had not yet been installed.
42	Contract Management	6/16/2014		First Failure	Consumed smart meter reported at SaskPower customer residence in McLean, SK.
43	Contract Management	6/30/2014		Three Failures	Consumed smart meters reported at SaskPower customer residences in Pilot Butte, Regina, Strasbourg-Earl Grey.
44	Contract Management	7/1/2014	7/10/2014	Exec Meetings	SaskPower advised that daily meetings were held after the three incidents on June 30, 2014 to address concerns and attempt to identify the cause of the consumed smart meters. SaskPower announced on July 10, 2014 that they would be halting further installation.
45	Contract Management	7/9/2014		Failure	Consumed smart meter reported at SaskPower customer residence in Pasqua First Nation.
46	Contract Management	7/10/2014			SaskPower announces that they have halted the installation of smart meters.
47	Contract Management	7/13/2014		Failure	Consumed smart meter reported at SaskPower customer residence in Saskatoon.
48	Contract Management	7/24/2014		PGE to Replace Sensus Meters	Portland General Electric (PGE) announces the replacement of 70,000 Sensus residential smart meters. PGE used Sensus 2S Gen 3 RD smart meters that had the remote disconnect function and discovered issues internally in 2013 (three small meter fires, no injuries).
49	Contract Management	7/26/2014		Failure	Consumed smart meter reported at SaskPower customer residence in Saskatoon.
50	Contract Management	7/29/2014		Sensus President Meets with SaskPower	SaskPower executives advised that they met with the President of Sensus on July 29, 2014 and subsequently decided that they would recommend to the Board that the installed meters be removed. SaskPower advised they were in the process of holding an ad/hoc Board meeting when the Government of Saskatchewan ordered the removal of all meters on July 30, 2014.

#	Timeline	Event Date	End Date	Event Name	Description
51	Contract Management	7/30/2014		SaskPower Ordered to Remove Meters	SaskPower ordered by Government of Saskatchewan to remove smart meters. Announced by Hon. Bill Boyd, Minister Responsible for Saskatchewan Power Corporation. SaskPower advised it was preparing a briefing to its Board to recommend the same measure when this announcement was made by Minister Boyd.
52	Contract Management	8/9/2014		Failure	Consumed smart meter reported at SaskPower customer residence in Regina.
53	Contract Management	8/16/2014		CIC Review	CIC announces three separate streams of review into the AMI program and smart meter failures.
54	Contract Management	9/9/2014		Sensus Settlement with SaskPower	Sensus reaches settlement with SaskPower. Terms disclosed to media include a refund to SaskPower of $24 million for existing smart meters, $5 million for new product design for the Saskatchewan climate and $18M in credit towards new meters to be purchased from Sensus.

CROWN INVESTMENT CORPORATION

SASKPOWER SMART METER PROGRAM

ELECTRICAL

FIRE INVESTIGATION & REVIEW

PREPARED BY

ELECTRICAL CONSULTANT

October 24, 2014

Ritenburg & Associates Ltd.
Consulting Electrical Engineers

TABLE OF CONTENTS

Ritenburg & Associates Ltd.
Consulting Electrical Engineers

EXECUTIVE SUMMARY

SaskPower in 2012 implemented a plan to upgrade single phase, 240 volt meters for their customers in Saskatchewan. The majority of services affected are for residential customers although some are for small commercial customers. This upgrade did not encompass all residential customers. For example, residential customers located in large multifamily facilities utilize a different meter and were not included in this upgrade.

We have reviewed the SaskPower reports and other documentation. We have interviewed SaskPower personnel and inspected two of the failed meters and several meters returned to SaskPower through their internal Return Material Authorization (RMA) process. We have inspected new Sensus meters, a meter from Landis & Gyr and a meter from Itron. Our opinion is based on this information. To date we have not seen any information or reports from Kinetrics Inc. or Underwriter's Laboratory (UL).

After reviewing the information available, we are of the opinion that moisture and contaminants within the meter has been a major factor in the meter failures and ensuing fires. We have not found any issues with the new meter installation methods and practices.

1. INTRODUCTION

SaskPower in 2012 implemented a plan to upgrade single phase, 240 volt meters for their customers in Saskatchewan. The majority of services affected are for residential customers although some are for small commercial customers. This upgrade did not encompass all residential customers. For example, residential customers located in large multifamily facilities utilize a different meter and were not included in this upgrade.

The upgrade plan began in June 2013 and was halted in July 2014 after eight meters had been involved in fires. A total of approximately 142,000 meters were scheduled for upgrade and approximately 107,921 meters had been installed when the meter fires progressed into a trend that was disturbing. By August 9, 2014 eight meter fires had occurred.

Ritenburg and Associates Ltd. was retained by Robertson Stromberg LLP on August 21, 2014 to provide an independent review and assessment of the cause of Sensus USA Inc. meter fires and to review the product and its related uses and review all reports and information from Underwriters Laboratories and the testing organization, Kinectrics.

We have reviewed the SaskPower reports and other documentation. We have interviewed SaskPower personnel and inspected two of the failed meters and several meters returned to SaskPower through their internal Return Manufacturer Authorization (RMA) process. We have inspected new meters, a meter from Landis & Gyr and a meter from Itron. Our opinion is based on this information. To date we have not seen any information or reports from Kinetrics Inc. or UL.

2. TECHNICAL REVIEW

2.1 SMART METER IMPLEMENTATION

SaskPower intended to upgrade a variety of existing meters to the Sensus Generation 3.3 smart meter. The existing meters being replaced included old mechanical/electrical meters and electronic meters of differing manufacturer and age. This would be the first full scale meter modernization of a very large installed base for SaskPower. The single phase, 240 volt meters found on small electrical services throughout the SaskPower system represent the largest

number of meters but on the smallest customers. This class of customer does not represent large billing but are located throughout the province.

The meter upgrade began in the Regina and Saskatoon areas and was to shift to the smaller cities such as Moose Jaw, Yorkton, Weyburn, Swift Current, Prince Albert, etc. Some areas of the province such as the far north were not scheduled for an upgrade as part of this program.

The smart meter technology has been available for some time. Other utilities in Canada and the United States have implemented similar upgrades. There are many factors to consider in choosing a manufacturer. While most meters shared similar ability in accuracy of electricity measurement, how they accomplish this and the extra features varies between manufacturers. Sometimes terrain and geographic location are significant factors. SaskPower did find that Sensus was significantly less costly than other manufacturers. All smart meters utilize a digital radio frequency signal to communicate with a larger network.

Some of the more significant features of smart meters are as follows:

- Electronic measurement of power consumed.
- Transmission of measured data to central monitoring facility. This alleviates manual reads of meters.
- Ability to disconnect services for non-payment or safety issues such as overloads.
- Ability to detect meter tampering.
- Ability to determine extent of power failures and to identify restoration of power.
- Ability to measure a variety of other parameters and log data.

The Sensus smart meter technology uses an Advanced Metering Infrastructure (AMI) network that facilitates communications from the meters to AMI head end, through the Meter Data Management System (MDMS) servers and on to the SaskPower billing system. The MDMS and AMI head end equipment provide monitoring and the ability to interrogate and command the meter.

The AMI network is operating in some areas but is not fully functional. A great deal of data can be transmitted by the smart meters and the AMI in conjunction with the Regional Network Interface (RNI) network must record and manage the data. SaskPower must have an internal system and protocols for initiating a meter trouble call and reacting to the off normal data. This capability is not fully functioning.

2.2 DESTRUCTIVE EVENTS

The Sensus Generation 3.3 meters appeared to function correctly for several months. On June 16, 2014, the first meter fire was reported. Subsequently, there have been seven additional fires. All reported fires are shown below.

Fire Number	Date of Incident	Location	Install Date	Time in Service
1	16/06/2014	McLean NW28-17-15-W2	10/07/2013	11 months 6 days
2	30/06/2014	Pilot Butte - Crawford Developments 10 Bardel Crescent	26/07/2013	11 months 4 days
3	30/06/2014	Regina 1315 Maple Grove Crescent	02/04/2014	2 months 28 days
4	30/06/2014	Strasbourg - Earl Grey SW-26-21-20-W2	12/08/2013	10 months 18 days
5	09/07/2014	Pasqua First Nation House #16	03/04/2014	3 months 6 days
6	13/07/2014	Saskatoon 223 Marcotte Way	18/06/2014	0 months 25 days
7	26/07/2014	Saskatoon 1115 Shepherd Way	07/07/2014	0 months 19 days
8	09/08/2014	Regina 4510 Harbour Village Way	05/11/2013	9 months 4 days

Table 1: Fire Summary

The fires all occurred within two months and were located in Regina, Saskatoon, and their surrounding areas. Two of the meters had been in service less than a month. Four of the meters had been in service for more than nine months. The weather leading up to the failures is shown below.

Fire Number	Date of Incident	Location	Precip. that day	Precip. last 48 hours	Precip. last week	Precip. last month
1	16/06/2014	McLean NW28-17-15-W2	0.0mm	1.6mm	12.0mm	60.4mm
2	30/06/2014	Pilot Butte Crawford Developments 15 Bardel Crescent	12.1mm	92.0mm	101.9mm	175.1mm
3	30/06/2014	Regina 1315 Maple Grove Crescent	12.1mm	92.0mm	101.9mm	175.1mm
4	30/06/2014	Strasbourg - Earl Grey SW-26-21-20-W2	12.1mm	92.0mm	101.9mm	175.1mm
5	09/07/2014	Pasqua First Nation House #16	0.2mm	0.2mm	1.9mm	163.4mm
6	13/07/2014	Saskatoon 223 Marcotte Way	0.2mm	0.6mm	1.8mm	92.3mm
7	26/07/2014	Saskatoon 1115 Shepherd Way	3.0mm	12.9mm	26.6mm	52.1mm
8	09/08/2014	Regina 4510 Harbour Village Way	5.9mm	38.5mm	54.6mm	86.3mm

Table 2: Related Precipitation. Source: Environment Canada

There was significant precipitation in the previous thirty days for all of the fires. There was significant precipitation in five of the fires within the preceding two days. The remaining three fires had light precipitation within the preceding two days. There is evidence that moisture and contaminants have been getting into the meters and possibly being trapped.

The precipitation at several of the fire locations preceding the fires have been unusually heavy.

For the Regina area, the precipitation in the preceding months is as follows.

July 10 - July 31, 2013:	Total precipitation 41.3mm, highest daily rainfall July 23 @ 9.0mm
August 2013:	Total precipitation 23.5mm, highest daily rainfall Aug 06 @ 13.4mm
September 2013:	Total precipitation 39.6mm, highest daily rainfall Sept 18 @ 17.5mm
October 2013:	Total precipitation 1.7mm
April 2014:	Total precipitation 62.4mm, highest daily rainfall Apr 23 @ 20.2mm
May 2014:	Total precipitation 37.2mm, highest daily rainfall May 31 @ 12.9mm
June 2014:	Total precipitation 175.1mm, highest daily rainfall Jun 29 @ 79.9mm
July 2014:	Total precipitation 19.9mm, highest daily rainfall Jul 24 @ 11.8mm

August 2014:	Total precipitation 134.8mm, highest daily rainfall Aug 24 @ 44.4mm, Aug 8 @32.6mm
September 2014:	Total precipitation 30.7mm, highest daily rainfall Sept 30 @ 8.0mm

For the Saskatoon area, the precipitation in the preceding months is as follows.

July 10 - July 31, 2013:	Total precipitation 19.1mm, highest daily rainfall July 21 @ 10.1mm
August 2013:	Total precipitation 14.7mm, highest daily rainfall Aug 05 @ 5.3mm
September 2013:	Total precipitation 14.9mm, highest daily rainfall Sept 26 @ 11.4mm
October 2013:	Total precipitation 4.4mm
April 2014:	Total precipitation 74.2mm, highest daily rainfall Apr 23 @ 23.9mm
May 2014:	Total precipitation 61.1mm, highest daily rainfall May 26 @ 22.3mm
June 2014:	Total precipitation 94.8mm, highest daily rainfall Jun 18 @ 23.7mm
July 2014:	Total precipitation 44.5mm, highest daily rainfall Jul 24 @ 13.5mm
August 2014:	Total precipitation 18.5mm, highest daily rainfall Aug 20 @ 10.4mm
September 2014:	Total precipitation 10.7mm, highest daily rainfall Sept 8 @ 7.0mm

For three of the fires, the precipitation preceding the fires is the heaviest since the meters were installed.

As the precipitation leading up to the fires is substantial, we are of the opinion that moisture and contaminants within the meter has been a factor in the meter failures and ensuing fires. Refer to meter construction section.

As a result of the first six fires, SaskPower has produced four reports. These include the Preliminary Safety Report and the Preliminary Technical Report detailing the first six fires. The remaining two include: Meter Investigation 1115 Shephard Way Saskatoon Version 3 and Meter Investigation 4500 Harbour Village Way Regina Version 3. We recommend that SaskPower finalize these reports.

SaskPower have historically had meter incidents, regardless of the type of meter used. Meter incidents include fires and other failures with the criteria of burnt/melted/blackened meter, fire/arcing/sparking meter, and exploded/blown meter from premise or pole. The following table summarizes these meter incidents for the past five years and the first seven months of 2014. It should be noted that only eight Sensus meters have been shown and these represent the eight meter fires. However, in addition to the 8 Sensus meter fires there have been 10 other Sensus meters that were returned to SaskPower due to a problem classified as burnt meter not shown in the chart below, bringing the total to 2014 total to 37. This would indicate that the Sensus meter issues were a total of 18 out of 37 for the first seven months of 2014.

The Sensus meter issues represents a significant portion of the overall meter issues for 2014. The total noted above, 37 is the 27 failures noted in the following table plus the additional 10 Sensus meters that were not included in the table.

	TOTAL	Urban	Rural	Oil Field	Sensus	SaskPower customers	Failure rate
2009	50	24	5	21		467,329	0.011%
2010	45	14	12	19		473,007	0.010%
2011	90	48	16	26		481,985	0.019%
2012	148	82	28	39		490,611	0.030%
2013	23	11	5	7	0	500,879	0.005%
2014: first 7 months	27	9	7	10	8	511,362	0.005%
Average/year	**63.8**	**31.3**	**12.2**	**20.5**		**487,529**	**0.014%**

Table 3: Historical Meter Incidents. Source: SaskPower

2.3 METER CONSTRUCTION

The Sensus Generation 3.3 meter has cost SaskPower less than $100 each. To achieve this low cost, the meters have been streamlined to several modules that attach to the back plane and each other. The various modules are interchangeable. Assembly and disassembly is relatively easy requiring few tools. A typical meter is shown below.

Figure 1: Front face of assembled Sensus meter

Figure 2: Back plane of assembled Sensus meter

Figure 3: Holes in back facilitate mounting of various Sensus meter modules.

Several of the meters involved in the fires were intact enough to disassemble and compare to the new meter sample. The following photo from SaskPower shows the bus arrangement from the damaged meters at McLean (#1) and Pasqua (#5) as well as a meter that was returned through SaskPower's RMA process.

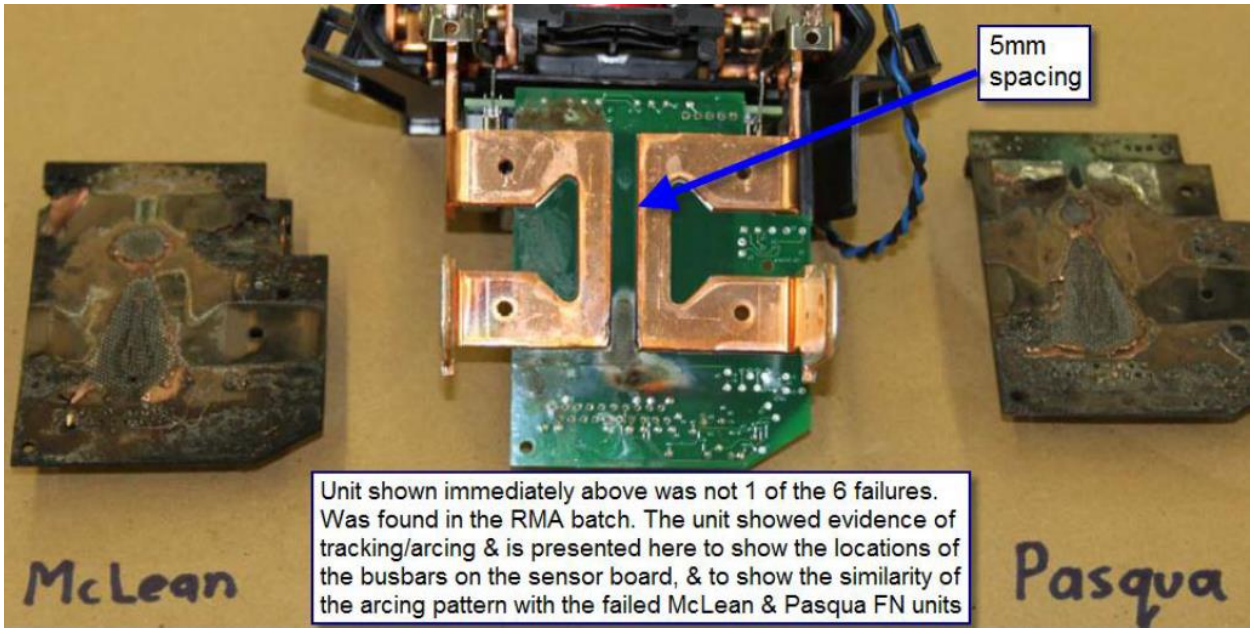


Figure 4: Comparison of burnt boards to RMA board. Source: SaskPower Preliminary Technical Report

The centre board shows clear evidence of arcing and tracking at the bottom of the bus that has resulted in a discoloration of the circuit board. On the left, the McLean board (#1) shows a similar pattern but has been damaged more. On the right, the Pasqua board (#5) shows a similar pattern but has been damaged more than the centre sample. The bus bars for both the McLean and Pasqua boards were vaporized in the destructive failure. However, the arcing and tracking pattern matches the sample.

From the inspection of two of the failed meters, we found no evidence of pitted or discoloured stabs on the meter. Pitted or discoloured stabs could be an indication of a hot socket problem. No indication has been found.

SaskPower found that the McLean board had increased levels of calcium, magnesium and aluminum suggesting the presence of dust within the meter.

The RMA process involves meters that have had issues in the field, and includes the eight meters involved in the destructive failures. The causes of these issues range from broken displays, overvoltage, communication issues, or simply the meters were dropped and no longer function properly.

SaskPower has dealt with 359 RMA cases so far since the inception of the smart meter program, and the symptoms have been recorded. The numbers are continually being updated, and may not include the most recent failures. Most of the RMA meters have not been fully investigated, and there are a large number of meters that have had issues but have not had the root cause identified. As the meters are inexpensive, it is often more efficient to issue new and return the problem meters to the manufacturer.

The category of failures can be summarized as follows:

- 18 meters have been burnt, and were no longer operational. This number includes 7 of the destructive meter fire failures.
- 3 more meters have had high temperature errors that were still functioning, but were discovered due to a burning plastic smell.
- 1 only had moisture as the cause.
- 107 meters had display problems, and 67 meters had error codes on their display.
- 35 RMA's had an unknown problem.
- 17 meters had no discernable issues.
- 20 had physical damage.
- 11 were sent to Sensus for special investigation.
- The remaining 47 RMA cases cover everything from communication loss to power issues.

These categories of failure only describe the symptoms. Unless the meter has been individually investigated, the underlying problem has not been documented. For instance, 107 meters had display problems, and 67 more had error codes on their display. The photos below show electrical arcing inside 3 of the meters that were RMA cases under the category “Display Error”. These RMA failures all exhibit electrical arcing in the same location as the destructive failure meters.

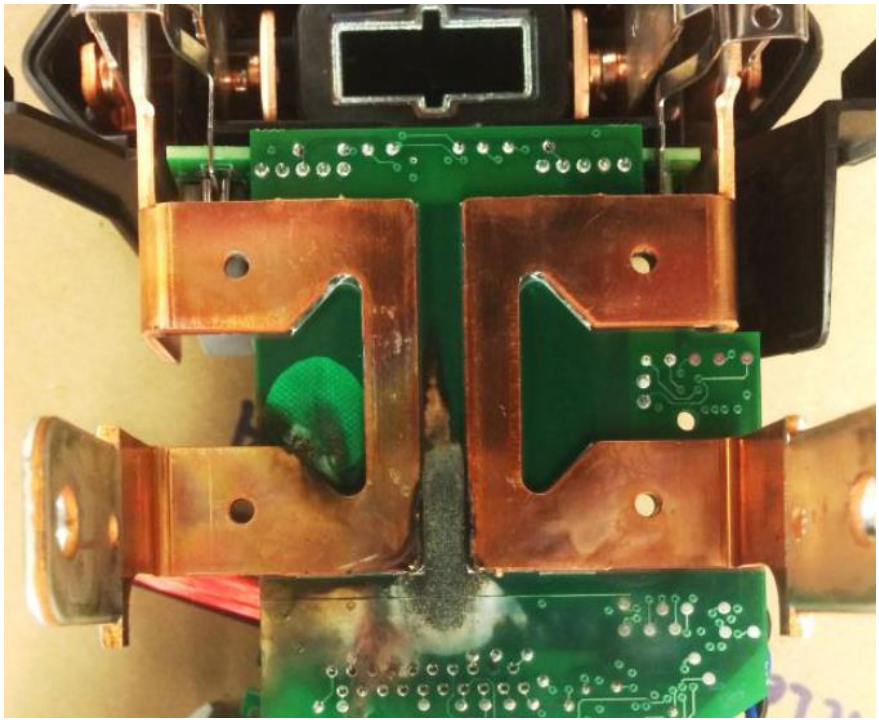


Figure 5: RMA Meter 997202 – Pilot Butte – Reported as meter display problem

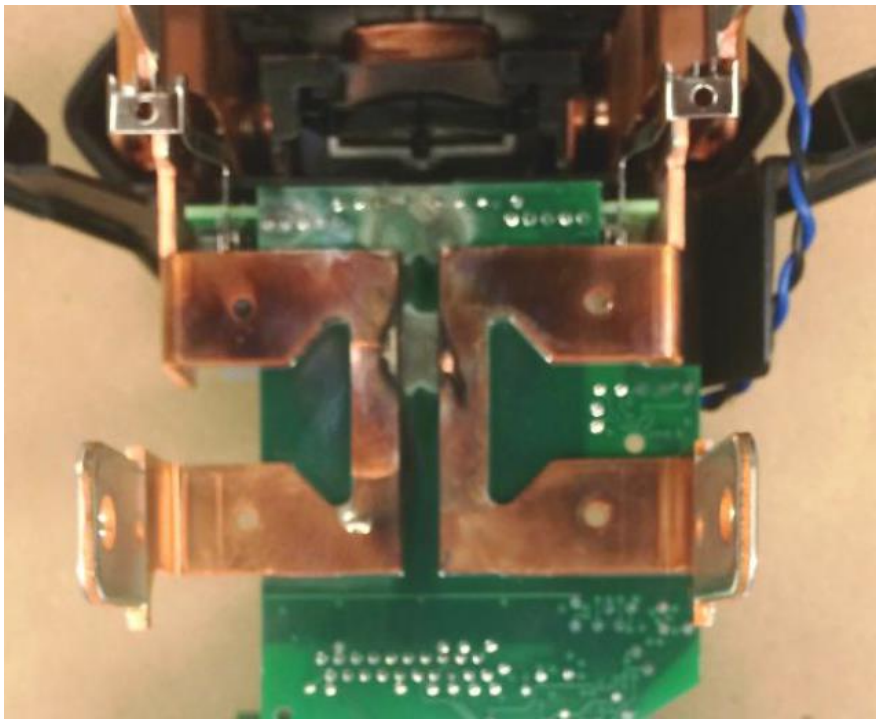


Figure 6: RMA Meter 998366 – Qu'Appelle – Reported as meter display problem

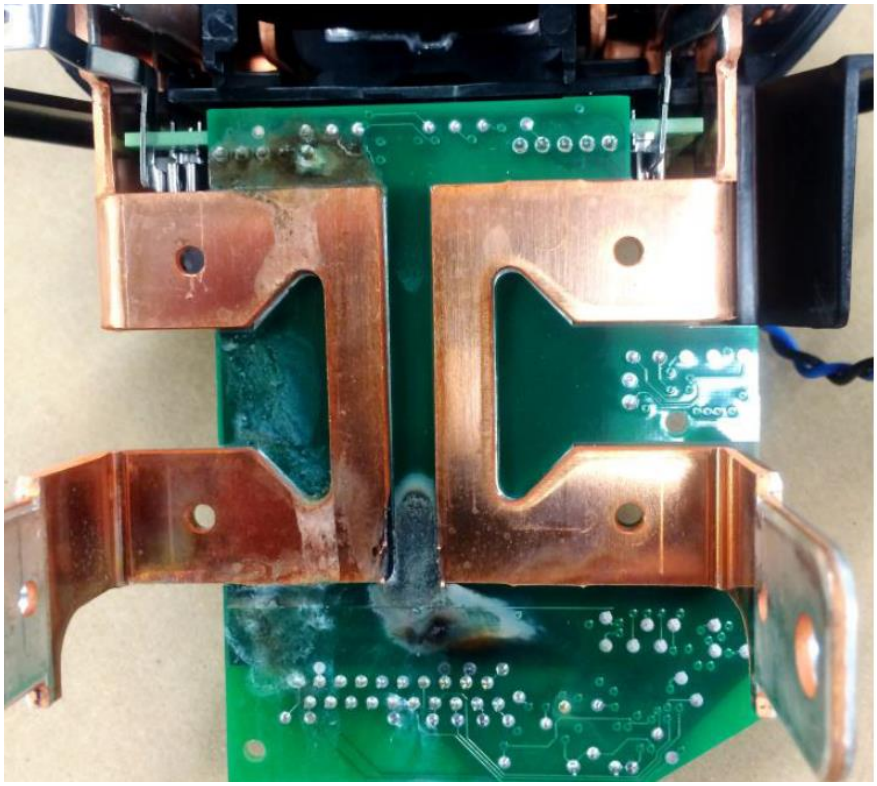


Figure 7: RMA Meter 1062400 – Moose Jaw – Reported as meter display problem

The three meters shown above were returned for reasons other than arcing and tracking. These meters may have functioned for some time despite the arcing problem or the arcing problem may have caused the display to fail. We are of the opinion that there may be meters in service that have had arcing issues and even if the display has failed. The problem would not be apparent to SaskPower until the next manual meter read. Several months could pass before SaskPower would become aware of the problem.

The following photo shows a meter that was returned through the SaskPower RMA process that has staining from smoke and evidence of moisture at the bottom of the meter.

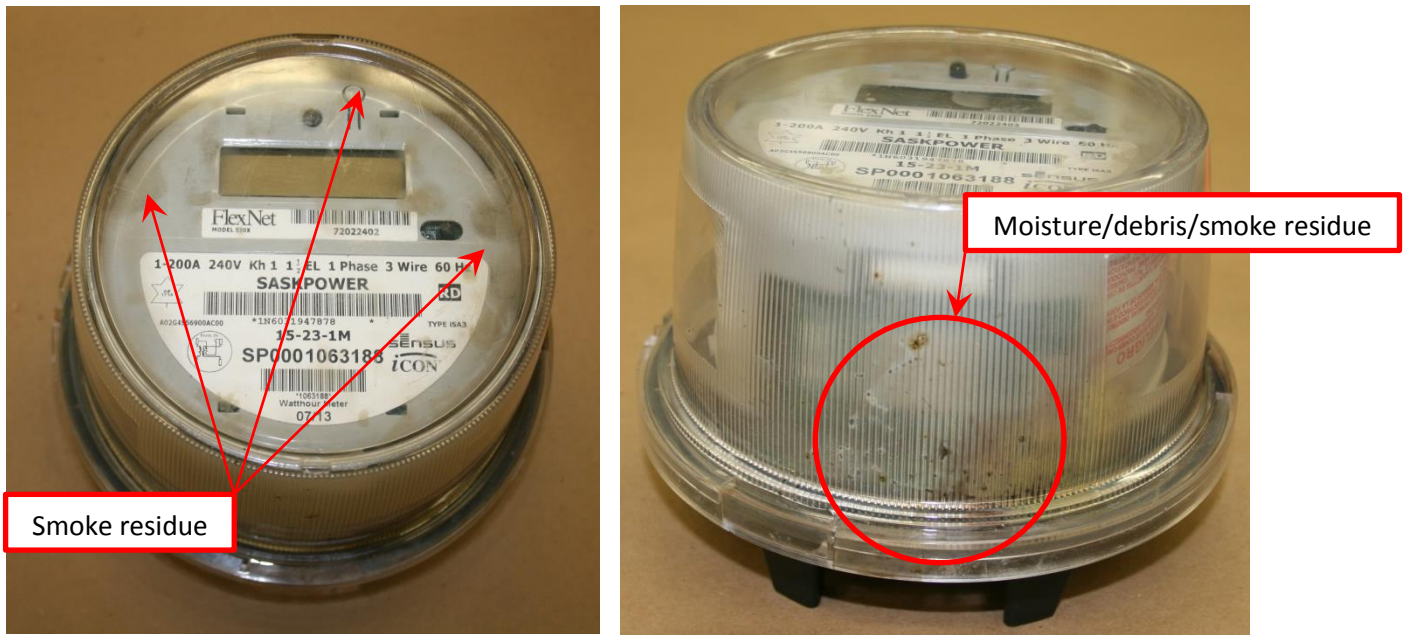


Figure 8: RMA Meter 1063188: Located at NE 301597828 – Reported as burnt meter

As indicated previously, significant precipitation occurred in the preceding days for several of the meter fires.

There is evidence that the Sensus Generation 3.3 meters are not very well sealed to keep moisture and dust out and includes the following.

- There is space around the stabs where they penetrate the back plane.
- There are several openings in the back plane which allow for the fastening of clips to mount internal components.
- There are several gaps in the clear enclosure cover where it meets the back plane.
- There is no gasket to seal the meter to the meter socket.

- When moisture is trapped within the meter, there is no path for it to drain away so the moisture and other contaminants remain inside the meter. This can also raise the relative humidity within the meter.

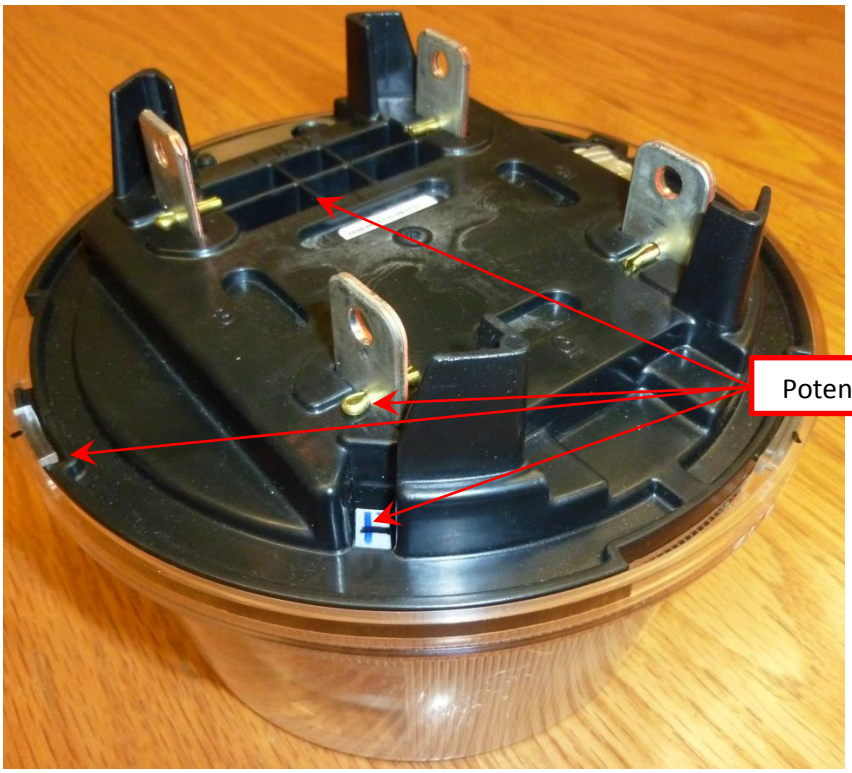


Figure 9: Backplane of Sensus meter

SaskPower have been using an Itron electronic meter, the Centron II for some time. This is the type of meter that was being utilized prior to the smart meter program and is the meter that is being used to replace the smart meters already in service. An Itron electronic meter was dismantled and the following photo shows the tubular bus.

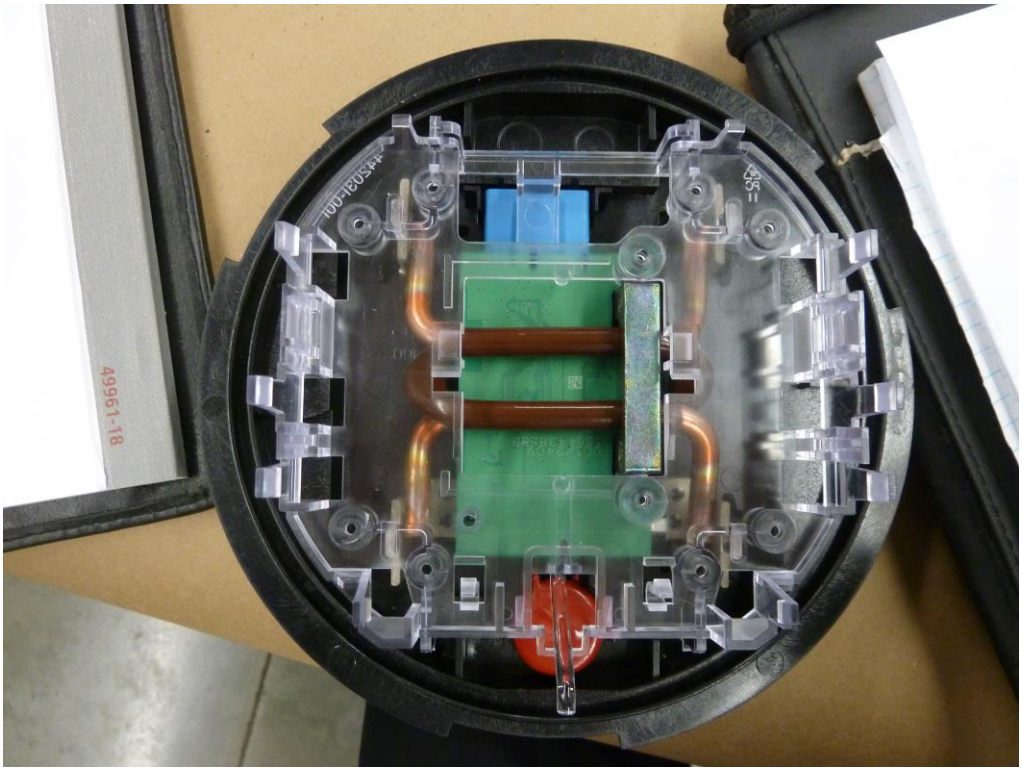


Figure 10: Backplane of Itron internal power board

Itron has used an insulating coating on the bus to ensure adequate insulation. There is no similar approach used by Sensus in their Generation 3.3 meter. However, the Generation 4 meter uses an insulated gasket under compression to improve the insulation system.

2.4 SENSUS GENERATION 4 METER

Sensus has provided an engineering sample to SaskPower of their Generation 4 meter. A number of changes have been observed when comparing the Generation 4 meter to the Generation 3.3 meter used in the upgrade program as follows.

- Tighter tolerances around openings in the back of the meter.
- The addition of a breather hole with a Gore-Tex filter to relieve humidity.

- The addition of a hole at the bottom of the meter clear cover to allow moisture to escape.
- A change in the type of plastic, possibly to reduce flame spread.
- An insulating gasket was added to provide further insulation over the bus bars on the printed circuit board.
- Sealing of slots in the plastic backplane so that water will follow the slot around to the bottom and drain water through the new drain hole.

These changes appear to focus on controlling entrance of water and water vapour into the meter as well as providing a means for trapped moisture or vapour to escape. These improvements also improve the insulation of the copper bus.

Landis & Gyr have used a gasket around the plastic cover to prevent moisture intrusion. The higher voltage components were separated from the micro-electronic components to provide a further degree of isolation. Generally the Landis & Gyr meter utilizes more robust materials than the Sensus meter although it lacks some of the electronic features offered by Sensus.

2.5 METER INSTALLATION

SaskPower utilized three groups of employees to complete the smart meter installation: Qualified Electrical Workers, Competent Electrical Workers, and SaskPower Exception Crew. All were involved in these installations, and were involved in at least one destructive failure event. The term Qualified Electrical Workers refers to an individual who has an electrician designation and may be employed by SaskPower or a private contractor. Competent Electrical Workers are those whom have completed a two week training course on installing electric meters. The SaskPower Exception Crew are SaskPower employed electricians who are usually dispatched to deal with special site problems.

Four of the fires occurred at sites where the meter had been installed by Qualified Electrical Workers. Three of them occurred at sites where the meter had been installed by Competent Electrical Workers, and one involved an installation by the SaskPower Exception Crew.

Due to the variance of installers at each fire site, simplicity of task, and qualification of workers, it is our opinion that there is no evidence to suggest that the installation caused any of the destructive failures.

2.6 MANUFACTURING AND FAILURE RATES

SaskPower indicated in their report, Residential Meter Failures, Preliminary Technical Report Distribution Services dated July 28, 2014, that of the first six meters that failed, three were from the same batch and lot. This means that three of the meters were manufactured at the same time. However, the remaining three meters of the initial six are from different batches and lots. The last two meters were also from different batches and lots. We have not been able to link the fire issues to variances in manufacturing.

SaskPower indicated in their report, Residential Meter Failures, Preliminary Technical Report Distribution Services dated July 28, 2014, that the rate of destructive failure for the first six meters is 0.006%, the non-destructive rate of failure is 0.252% and the total rate of failure is 0.258%. A total of 271 meters failed. The overall rate of failure appears to be within accepted industry standards. SaskPower has advised that as of Sept 2, 2014 that the number of failures has grown to 359. Many of the failures relate to minor problems such as a failed display. Some of the returned meters were found to be fully functional. In some cases, there was evidence that the meter had been dropped. These are described in more detail in the RMA cases in section 2.3 of this report. The 359 RMA meters do not exclude nor individually identify destructive failure events. See section 2.2 for further information on destructive meter incidents.

2.7 HOT SOCKET ISSUES

Hot socket issues have been flagged as a possible reason for some of the meter failures. The stabs on the back of the meter plug into connecting jaws in the meter socket. If the connecting jaws and stabs are loose and do not fit together with a tight fit, electrical heating can occur. Also, if the conductor terminations are not tight, electrical heating can occur. This heating is referred to as a “hot socket”. Generally, the amount of heat generated increases with the amount of current passing. For the first six fires, SaskPower tested the jaw tightness and found that all six sockets passed. At location six, cable terminations showed signs of heating that could result in a hot socket condition. The Sensus Smart Meter, Generation 3.3 has a temperature sensor that is typically set at 70 degrees Celsius. As the meter is communicating with the AMI network regularly, approximately every 30 minutes, a slow buildup of heat in the meter socket should result in a high temperature alarm. A high temperature alarm can also cause the meter to send a message more quickly outside of the regular communications interval. The temperature sensor is on the printed circuit board within the meter. As the heat source is the socket, the passage of time is required for the heat to build up temperature within the meter enclosure. The heat buildup is directly related to the amount of current passing through the

bad stab, jaw and cable termination. The more current, the more heat generated. This type of failure most often occurs over an extended period of time. As a result, a high temperature alarm should have occurred. SaskPower has indicated that many of the smart meter features including temperature alarms were not fully functional at the time of the fires. Meter readings were also being made manually. For a variety of reasons it appears that high temperature alarms were not being received and/or monitored consistently.

The maximum demand on the service at this time is reported by SaskPower to be approximately 25 amperes, which is between 12% and 25% of the service capacity, depending on whether the service is 200 amperes or 100 amperes. From June 21 to July 12, SaskPower reports the typical load to be approximately one half of the maximum demand. As the load was very light, we feel that a hot socket condition resulting in a destructive meter failure and fire are not likely.

2.8 METER COMMUNICATION LOSS

In several of the fire situations, there was a loss of communication with the meter. For example, with fire number 4 in Earl Grey, a loss of communication occurred 27 hours prior to the customer calling to advise of a power outage. In fire number 1, the loss was 5 hours and fire number 5, the loss was 3 hours. SaskPower advises that interruptions for up to a day can be expected. There are several reasons but many are related to communication bandwidth being insufficient.

This trend makes reporting of off-normal conditions on a timely basis somewhat unreliable.

2.9 OVER-VOLTAGE ISSUES

Sensus has claimed that some of the smart meter fires were caused by utility over-voltage. Most services are fed from a transformer that serves other customers. If an over-voltage situation occurred, then the other services and the meters fed from the same transformer would have been subject to the same potentially harmful over-voltage condition.

During their investigation, SaskPower, removed meters from adjacent customers. These meters were dismantled and checked for signs of arcing and other abnormal conditions. No arcing or failure of Metal Oxide Varistors (MOV) was found. The MOV's provide protection against surges and over-voltage conditions. However, there was some evidence of moisture and dust intrusion.

Over-voltage of 282 volts was found for fire number 2 at Pilot Butte and SaskPower did have a system disturbance at the time. Over-voltage of 288 volts was found for fire number 3 and SaskPower did have a system disturbance at the time. Over-voltage of 265 volts was found for fire number 4 at Earl Grey and SaskPower did not have a system disturbance at the time. The smart meters are rated for an over-voltage of 20% or 288 volts.

We have not found any evidence to support that a significant over-voltage occurred and resulted in a destructive meter failure.

SaskPower personnel and their report indicate that the MO's installed within the meters and those that were not destroyed by the fire, were tested and found to be intact. SaskPower indicates that system switching or operation, system over-voltage, or system protection mal-operation was not found to be a factor in these meter failures and fires. We have found no evidence that would be contrary to this finding.

3. RELATED STUDIES AND DOCUMENTS

3.1 UNDERWRITERS LABORATORY REPORT

Not yet received by SaskPower

3.2 KINETRICS REPORT

Not yet received by SaskPower

3.3 UL & ANSI STANDARDS

The Sensus Generation 3.3 meters had not been tested when selected by SaskPower for this meter upgrade program. UL has a new standard UL2735 that was published in May 2013. This standard does stipulate construction and performance requirements. Prior to the first issue of UL2735, standard UL 61010 had been considered by SaskPower to be the best UL standard that might be applicable to smart meters. The scope of UL 61010 encompasses both laboratory equipment covered in Healthcare applications and equipment covered under other industrial applications. This standard does not fully apply to utility metering equipment.

We have been unable to find any information that shows that the Sensus Smart Meter Generation 3.3 meets either UL61010 or UL2735. Due to the date that UL2735 was issued, it is

not unexpected that there was no SaskPower initiative to have UL2735 compliance on the Generation 3.3 meters. UL 61010 has been available for many years. As this standard largely focuses on other types of equipment such as those used in the Health Care industry, it is not unusual that a utility meter manufacturer would not certify their product to this standard. However, as more issues and problems have arisen with the Sensus meters, certification particularly to UL 2735 is very important.

SaskPower has suggested that the new Sensus Generation 4 meter will likely meet UL2735. We have not found any documentation that establishes certification with UL 2735. The upcoming UL report will provide a better insight to this possible certification.

Other manufacturers such as Landis + Gyr, who were considered by SaskPower for this meter upgrade, do not meet UL 2735.

Itron electronic meters have been used by SaskPower for many years and are the manufacturers of the meters being used to replace the Sensus smart meters. The Itron meters do not meet UL 2735.

ANSI is the American National Standards Institute and provides a certification program for a large variety of electrical equipment including utility metering equipment. Sensus Generation 3.3 meters meet the following ANSI standards.

- ANSI C12.1 - 2001
- ANSI C12.10 – 1997
- ANSI – C37.90.1 – 1989
- ANSI – C12.20 – 2002 (Class 0.2)

Landis + Gyr meet the following ANSI standards.

- ANSI C12.1
- ANSI C12.10
- ANSI C12.19
- ANSI C12.20

Itron meet the following ANSI standards.

- ANSI C12.1 - 2008
- ANSI C12.20 (Class 0.5) - 2010
- ANSI C12.18 - 2006
- ANSI C12.19 - 2008
- ANSI C12.21

4. CONCLUSION

We have reviewed the SaskPower reports and other documentation. We have interviewed SaskPower personnel and inspected two of the failed meters and several meters returned to SaskPower through their internal RMA process. We have inspected new meters, a meter from Landis & Gyr and a meter from Itron. Our opinion is based on this information. To date we have not seen any information or reports from Kinetrics or UL.

After reviewing the information available, we have found the following.

- No indication with the two failed meters of pitted or discolored stabs that might be indicative of a “hot socket” condition.
- Indication that one meter had increased levels of calcium, magnesium and aluminum suggesting the presence of dust within the meter.
- Indication that several meters, aside from the failed eight meters, had arcing and tracking between the two bus bars on the main board.
- Indication that some meters had indication of staining from dust and moisture in the bottom of the meter.
- No indication was found that would suggest that the meter installation caused any of the destructive failures.
- Indication of very significant precipitation preceding the meter fires.
- In 2014, the rate of SaskPower meter failures was not significantly greater than the historical average. However, Sensus meters were involved in a substantial portion of these failures.
- There is some danger with destructive meter failures and potential resulting fires.
- No evidence that over-voltage caused the meter to fail destructively

In view of the above, we are of the opinion that moisture and contaminants within the meter has been a major factor in the meter failures and ensuing fires.

5. RECOMMENDATIONS

Throughout the investigation process for this report, several areas have been identified where alternative methods could be considered. This section highlights a few areas of possible improvement that might be considered in a new smart meter program.

5.1 METER PHOTO RECORDS

There is currently a procedure for SaskPower meter installers to take pictures of the old and new meters when a new meter is installed. The pictures are generally close-ups of the meter faces, which provide little insight to site conditions when viewed later. A more detailed approach would be to take pictures of the meters before and after installation, the meter socket/jaw conditions, and also an area photo that is taken from further away showing the conduit stubs from the ground into the meter and general site conditions. This would provide a more complete picture of the install site and existing conditions of the meters and socket. This information would be helpful if problems develop in the future.

5.2 METER ANALYSIS

There has been evidence of electrical tracking on the power boards of a number of meters that have been returned for other reasons, as described in section 2.3. Without further information, it is difficult to determine if this problem is more significant and involves larger numbers of meters. Furthermore, some of the electrical tracking and its symptoms could go unnoticed, caused by the large timeline between physical meter reads. There is a possibility that there are a number of working meters that were not part of any previous RMA and may have signs of arcing between the bus bars.

We understand that during the removal of all 107,000 smart meters, SaskPower has not investigated any of the normal in service meters and has been disposing of these meters. A statistical sample could be taken of sufficient size to provide a reliable data set for analysis. This may show that there are additional meters showing signs of degradation or it may confirm that there were no significant further problems.

5.3 DESTRUCTIVE EVENT REPORTING

As described in section 2.2 SaskPower has produced four reports. These include the Preliminary Safety Report and the Preliminary Technical Report detailing the first six fires. The last two reports were created each detailing the seventh and eighth fire respectively. These last two reports should be combined with the first two, forming a single safety report and technical report. Lastly, these documents still marked as "Preliminary", and should be finalized. All meter incidents should be reported and an ongoing data base created to document the evidence of each incident as well as providing a means to monitor trends and problems with certain types of meters.

5.4 METER DEPLOYMENT

SaskPower's deployment plan included a limited and concentrated installation in the town of Hanley in order to test the meters before rolling the program out to the rest of the province. This test showed that there were issues that required attention. A full firmware upgrade was required to alleviate some of the nuisance alarm problems. The next step in deployment included Regina/Saskatoon and surrounding areas. This is a large step, from roughly 500 meters to over 100,000 meters installations.

It was discovered that even after the 100,000 installations were completed, the AMI network was not fully operational and that further work was required to allow remote reading of the meters. All smart meters were still being read manually by SaskPower personnel at each installation location for billing purposes. Measurement Canada requires a certain number of meters communicate successfully before the data can be remotely read and used for billing purposes.

Furthermore, there was no record of the reception of a high temperature alarms in any of the eight destructive events. There is no way to distinguish if the absence of the high temperature alarm was caused by the meter never sending the alarm or the AMI network was not able to receive or process it. These issues indicate that the system was not fully operational in both billing and smart meter event records.

In future smart meter implementation plans, it may be prudent to use a smaller rollout and get the entire system fully commissioned and operable before embarking on a province wide program. This would require that the AMI network, billing interface and meter alarms capabilities be fully functional. An example would be the installation of several thousand meters in Regina where trouble shooting and access to engineers and other specialists are easy. This would allow the development of standard practices, such as appropriate responses to

certain meter alarms such as hot socket/high temperature. While there may have been more factors such as cost concerns driving a large implementation, problems do surface which can affect the program and related issues.

5.5 SENSUS METER REPLACEMENT

As there is some danger with destructive meter failures and potential resulting fires, we recommend that the existing Sensus Generation 3.3 meters be replaced as soon as possible. As the existing meter fires have had a close relationship to precipitation levels, SaskPower might wish to consider replacement no later than the end of winter and before the spring thaw and spring rains begin.

6. AUTHENTICATION

CROWN INVESTMENTS CORPORATION

SUMMARY OF THE SASKPOWER SMART METER REVIEW OF CONTRACTUAL ADEQUACY AND DUE DILIGENCE

Robertson Stromberg LLP
October 23, 2014

Introduction

On August 12, 2014, CIC engaged Robertson Stromberg LLP to conduct an independent investigation and produce a report about the legal issues surrounding SaskPower's Smart Meter Program. While that report is covered by legal privilege, the following summary outlines the basic findings.

In the course of preparing its report, Robertson Stromberg reviewed thousands of pages of contracts, reports, emails and general documentation. In addition, the law firm interviewed 20 different employees and consultants of SaskPower, and used its own resources for contract review and information gathering.

Summary of Findings

The Essence of the Problem

It became apparent early in our review that, until well after contract formation, there was a breakdown in risk assessment, in that no one at SaskPower had considered the possibility that there might be a defect in the smart meters, critical to customer safety, that would require all of the installed meters to be removed from service. The risk that there would be such a defect was one that was therefore improperly protected against in the contractual documents.

Customer safety does not appear to have been a consideration until after reports of smart meter fires involving PECO (Philadelphia Electric Company) arose. It did not become a matter of central importance until June of 2014.

Notwithstanding a well-crafted and thorough set of contracts, there was, in our opinion, a significant gap in protection for SaskPower, in the Sensus procurement contract, in that it limited the rights of SaskPower to claim indirect and consequential damages from Sensus where these losses flowed from a safety defect of the sort that was fundamental to the meters themselves.

The reason behind the presence of this gap in contractual protection is more difficult to determine. It cannot be assumed that it was the fault of the contractual drafters, who cannot be expected to protect against risk of which they are unaware, or against risk accepted by SaskPower as part of the negotiation process. One might expect that the risk of a safety defect is one that can be more readily identified by engineers, or by specialists in meter procurement and deployment. One of the key elements of this review is that no such risk was identified prior to the completion of the major contractual documents.

In the end, the process did not appear to sufficiently identify and allocate the risk associated with the very problem which arose, being a safety defect in the meters, with the possibility that they might ignite, and cause property damage and/or personal injury.

Notwithstanding the contractual limitations in the Sensus procurement contract, there were a number of opportunities presented to SaskPower to protect itself from the economic loss flowing from the safety defect. In this regard, additional due diligence might have led to a decision to stand down the project, by stopping the procurement and installation of Sensus meters. These opportunities presented themselves as possible "red flags". Taken in combination, these red flags, and due diligence flowing therefrom, might reasonably have been enough to cause SaskPower to stand down its program, until they could be certain that the Sensus meters did not present a risk.

Our review also showed that the risks inherent in the Sensus procurement contract were not present in the Grid One contract.

General Observations

We made a number of general observations that might assist in giving an understanding as to what led to the apparent failure of the AMI project team to identify, prior to executing the Sensus procurement contract, the most significant risk, that of a safety defect, justifying the total removal of all of the meters that had been installed.

The first is the apparent lack of "ownership" for the project, in the time-frame before February 2012. The apparent deficiency in leadership during the early stages of the AMI project occurred during a critical time for risk identification, when there does not appear to have been any one individual who took responsibility for risk identification and in particular, for the identification of the risk that would flow from a safety defect.

This leadership issue may never have been resolved. During the course of this investigation, on the issue of risk management, we had difficulty determining with certainty where the "buck stopped" as many simply felt it a group effort.

Another issue was the fact that SaskPower relied on a variety of consultants, whose authority to interact with the SaskPower legal department may not have been clear. This may have contributed to a disconnect between those who drafted the contracts and the buyer procurement team. During the interview process we heard that at times it was difficult to know who was an employee and who was a consultant resulting in a situation where some key individuals in this process did not appear to have knowledge of critical facts.

Once Sensus was selected and the process continued, there were a number of red flags that failed to elicit an adequate response from SaskPower. Three such examples were:

1. Correspondence from one of the proponents of the RFP process whose proposal was ultimately rejected in favor of Sensus. This correspondence raised the prospect that more due diligence should have been directed towards both Sensus and the product they offered. This flag was dismissed by SaskPower consultants.

2. Litigation initiated in 2010 in Alabama (Baker litigation) that alleged fault with the Sensus product that resulted in fires similar to those that occurred in Saskatchewan. While this litigation appears to have been dismissed by April, 2011, there was no mention of this litigation by Sensus at the time it was negotiating its contract with SaskPower. SaskPower became aware of the Baker litigation in late March 2012; after the Sensus procurement contract was effective but prior to any significant work orders being executed. This flag was dismissed by consultants as involving an earlier version meter and thus concluding that the litigation should not be of concern.

3. In August 2012 SaskPower became aware that PECO was dealing with issues related to overheating in meters provided by Sensus. Subsequently PECO announced the replacement of several thousand Sensus meters. We found that the implications of PECO's actions were clearly appreciated by the legal department. This concern was shared with other members of the team, who then visited PECO to learn more. However, one of the lessons available from that visit was the need to have the meters independently tested by UL, which was not done.

SaskPower received advice from its external legal counsel that a "stepped procurement" process would have been valuable, where small numbers of meters could have been purchased and installed in a gradual manner in order to allow time to judge performance. However, for budgeting reasons, SaskPower

departed from this process when it bought more than 100,000 meters in a three week period between October 23 and November 15 of 2013.

Recommendations

Given that no one involved in the AMI project was alert to the risks that would flow from a safety defect, advice from risk management consultants should be sought for projects such as the smart meter initiative in order to establish processes and procedures to better identify and manage associated risks.

Consideration should also be given to the possibility of allocating risk through the use of product liability insurance or recall insurance, which would be purchased by the vendor to protect the buyer, or SaskPower in this case.

Roles and responsibilities with regard to risk management and for how to deal with external legal counsel should be more clearly defined.

CIC-SASKPOWER SMART METER REVIEW

TERMS OF REFERENCE

DATE AUGUST 15, 2014

Crown Investments Corporation of Saskatchewan

SMART METER REVIEW
Terms of Reference

1. PURPOSE

The Government of Saskatchewan has requested that Crown Investments Corporation (CIC) undertake a detailed review of Saskatchewan Power Corporation's (SaskPower) Smart Meter program following eight meter related fires. This review will be conducted in two parts:

(1) A consulting firm will review and assess the adequacy of SaskPower's due diligence, procurement and contract management practices relating to the Smart Meter program.
(2) A legal consultant will:
    a. review the contracts and agreements between the parties to advise on possible legal options for SaskPower, including receipt of financial compensation.
    b. to preserve SaskPower's legal privilege, the firm will engage an engineering firm on CIC's behalf to provide an independent assessment of the cause of the fires.

SaskPower has engaged two firms to conduct reviews to assist in determining the cause of the fires. CIC's legal consultant will coordinate its efforts with SaskPower, to provide an independent assessment to CIC.

CIC is the project owner. SaskPower is a wholly owned subsidiary of CIC and will make available all documents, data and employees required for the completion of this review. The consultant will provide CIC with a final report, including findings and recommendations, for public release.

2. PROJECT BACKGROUND

Crown Investments Corporation

CIC is conducting an external review of SaskPower's Smart Meter program, as directed by Cabinet, to assess the adequacy of SaskPower's processes to ensure its safe and effective implementation.

SaskPower

SaskPower is a vertically integrated electric utility providing generation, transmission, distribution and retail services. SaskPower operates or buys electricity supply from a generating fleet that use a wide range of fuels (e.g., coal, hydro, gas, and wind). SaskPower has the exclusive franchise to supply, transmit, and distribute electricity and provide retail services to customers in the Saskatchewan. Two cities, Saskatoon and Swift Current, have retained their municipal franchise to supply and distribute electricity.

Advanced Metering Infrastructure (AMI)

SaskPower's AMI program consists of the replacement of SaskPower's existing electric meters with an AMI electric meter and retrofitting SaskEnergy's gas meters with a two-way AMI communication module, installed at a customer's home, farm or business.

AMI also includes a provincial communication network to deliver information from the AMI meters to SaskPower, where it will be integrated into corporate systems for customer billing and other operational purposes. The key customer benefit associated with AMI is increased operational efficiency and real time information, which will allow earlier detection of outages.

Full AMI deployment would involve approximately 500,000 AMI electric meters installed and approximately 360,000 gas meters retrofitted with two-way AMI communication gas modules. These devices will communicate across a network consisting of approximately 400 tower sites across the province. These are primarily existing SaskTel tower locations where AMI equipment is then installed.

The AMI program was approved by the SaskPower Board of Directors in August 2010 with an associated budget of $190 million. Over the next year, SaskPower and SaskEnergy completed key project vendor procurements, and ultimately selected Sensus USA Inc. for the supply of the AMI solution (electric and natural gas meters/modules, communication base stations, and associated information technology systems) and Grid One Solutions Inc. for electric meter and gas module installation.

Equipment delivery began in early 2012, as did laboratory and field testing activities. These activities continued through the fall of 2013 when full meter and module deployment commenced.

At the end of July 2014, approximately 105,000 electric meters and 75,000 gas modules were installed, and 280 network sites had been commissioned.

Since the beginning of June, eight newly installed smart meters have caught fire causing Cabinet to direct SaskPower to replace 105,000 newly installed smart meters.

3. OBJECTIVE

Public safety and transparency are of paramount importance to SaskPower and its Shareholder, the Government of Saskatchewan.

The overall objective of this review will be to evaluate SaskPower's due diligence throughout the Smart Meter process, as well as determine SaskPower's legal options, including receipt of financial compensation.

4. PROJECT OWNERSHIP

CIC will engage consultants to undertake a review of SaskPower's due diligence exercised in: (1) the selection of the smart meter supplier (Sensus USA Inc.), (2) the acquisition of meter installation services from Grid One Solutions Inc., (3) the review of all contractual provisions relating to the AMI program implementation; and also, (4) provide an independent assessment of the cause of the Smart Meter fires.

CIC and SaskPower will make available any staff resources and will provide the required documents, correspondences, and any other information required for the successful completion of the engagement.

SaskPower has engaged Underwriters Laboratories (UL) and Kinectrics to conduct reviews to assist in determining the cause of the fires. To preserve SaskPower's legal privilege, CIC's legal consultant will engage an engineering firm on CIC's behalf to provide an independent assessment of the cause of the fires.

5. SCOPE

The scope of this review will include:

1. SaskPower's due diligence exercised in the selection of the supplier of Smart Meters, including, but not limited to:
    - the factors used to evaluate the suppliers, measured against best practices;
    - the process used to evaluate health and safety concerns; including the appropriate level of field testing, etc.;
    - compliance of technology with safety and measurement regulations;
    - compliance with SaskPower's internal policies;
    - consideration of company reputation and product history; and,
    - the ongoing supplier contract management.

2. SaskPower's due diligence exercised in the selection process for the contract of installation services, including, but not limited to:
    - the process used to evaluate installation service providers;
    - review documentation; including the including the request to the Ministry of Labour Relations and Workplace Safety regarding the qualifications of the installers;
    - the examination of smart meter installation programs in other jurisdictions;
    - compliance with SaskPower's internal policies; and,
    - the contract management oversight of meter installation work by Grid One, to ensure the safe installation of meters.

3. Legal due diligence related to, but not limited to:
    - breach of contract, termination and dispute resolution if performance or safety issues emerge;

- payment terms and hold backs to protect SaskPower's financial interests in the event of problems; and,
- SaskPower’s ability to receive compensation recovery.

4. Assessment of the cause of the Smart Meter fires. CIC’s legal consultant will engage an engineering firm on CIC’s behalf.

The consultant(s) shall have full discretion to pursue all lines of inquiry deemed appropriate in meeting the review’s objective.

6. REPORT

The results of the review will be utilized by the Government of Saskatchewan to assess SaskPower’s due diligence throughout the Smart Meter process, and ensuring public safety. CIC will prepare a public report outlining the results of the review, while preserving SaskPower’s legal position on future damages.

CIC expects the report to be completed and made public by late October.