
Smart Grid Control System – Outage Management System – Award of Contract

Recommendation

That the Standing Policy Committee on Environment, Utilities and Corporate Services recommend to City Council:

1. That the proposal submitted by Survalent Technology Corporation for supply of an Outage Management System, including a five-year software maintenance period at a total estimated cost of \$379,986.30 (including GST and PST) be approved; and
2. That Purchasing Services issue the appropriate Purchase Order.

Topic and Purpose

The purpose of this report is to request City Council approval to enter into a contract with Survalent Technology Corporation (Survalent) for the supply of an Outage Management System (OMS) with the inclusion of a five-year software maintenance period.

Report Highlights

1. With the implementation of an OMS, response times for power outage restoration would be improved as the system would be utilizing real-time data obtained from smart meters to detect outages.
2. The OMS would provide systematic coordination and management of power outages, pooling information from multiple sources and helping to assess and coordinate outage restoration. This is critical during wide-spread system events such as major storms.
3. The OMS would enhance communication both externally to customers and internally to staff by providing clear and coordinated map-based power outage notifications, alerts, and restoration updates.
4. When the Smart Grid Control System was purchased from Survalent in 2016, the system's ability to integrate with both existing and future applications was considered. Implementing the OMS from Survalent leverages work already completed to integrate systems at Saskatoon Light & Power (SL&P).

Strategic Goals

This report supports the long-term strategy to leverage technology and emerging trends under the Strategic Goal of Continuous Improvement. Through the addition of an OMS to the Smart Grid Control System, SL&P can reduce power outage times which supports the long-term strategy to enhance public safety under the Strategic Goal of Quality of Life.

Background

A new Smart Grid Control System was purchased from Survalent in 2016 to build a smarter energy infrastructure and an advanced energy delivery system. The contract with Survalent outlined four phases:

- Phase 1: Install and implement the new control system software and hardware;
- Phase 2: Build connections to integrate Geographic Information System/Advanced Metering Infrastructure data;
- Phase 3: Implement dispatch and control optimizations; and
- Phase 4: Implement outage management.

City Council initially approved the first two phases of this project. The Smart Grid Control System is fully implemented and operational. The system has been integrated with information from the utility's Geographic Information System and the Advanced Metering Infrastructure system that collects data from smart meters.

SL&P is recommending that Phase 4 be implemented next due to the significant benefits that will be realized for customers during power outages. Once this work has been completed, SL&P will bring a further report to City Council to recommend the implementation of Phase 3, which involves optimizing the distribution system to improve voltage control and reduce energy losses.

Report

SL&P has achieved a reliability over the last ten years that meets or exceeds the Canadian Electricity Association average for urban utilities. There are approximately 130 unplanned power outages that occur annually with an average duration of 120 minutes.

Power Outage Response Times

Currently, 30% of unplanned power outages result in a system-generated alarm at the System Control Centre. For the remaining 70% of unplanned outages, the utility relies on phone calls from affected customers to provide notification of the outage. This creates an initial lag affecting restoration times.

The recently installed Smart Grid Control System integrates data received from smart meters and other smart devices installed along the distribution system. Investment in this technology has positioned SL&P to move forward with the implementation of the OMS phase of the project.

The OMS provides a framework to verify and track reported outages by receiving digital signals from the meters indicating that an outage has occurred. Utilizing this information in combination with the Geographic Information System allows a map to be automatically generated defining the affected area. This shortens response times and speeds up restoration efforts.

Other electric utilities who have implemented an OMS have indicated that their reliability metrics were worse in the first year as it was discovered that not all outages were

officially recorded and estimates of the numbers of customers affected were conservative. It is anticipated that the implementation of an OMS for SL&P would reveal a similar impact on reliability metrics in the short-term.

Power Outage Coordination and Management

During larger system events such as major wind storms, it is common for multiple power outages to occur simultaneously. These events can generate over 1,000 phone calls with reports of broken tree limbs on lines or other concerns from customers. SL&P is currently not able to automatically relate trouble calls or prioritize incident responses. The coordination of crew dispatch is done manually with limited ability to efficiently track the effectiveness of restoration efforts and resolution to customer concerns.

The OMS is designed to:

- Pool outage and trouble calls from all available sources;
- Assess priority;
- Coordinate the dispatch of crews;
- Generate management and reporting tools that can be used internally to share dashboard views of various key performance indicators;
- Verify restoration efforts by re-checking Advanced Metering Infrastructure information to confirm the power has been restored to all customers; and
- Record and review outage events to determine ‘weak spots’ in the system and plan for remediation.

Power Outage Communication

One of the key features of an OMS is its ability to communicate power outage information for use by both customers and internal staff.

An OMS uses mapping technology to graphically show the extent of an outage. Maps produced by the OMS can then be displayed on webpages for customers to view. Since the area affected by an outage can be quite irregular in shape, a map is an effective communication tool. The system will also have a variety of other communication options that can be enabled as desired, including the ability to send updates by email, text, and social media. SL&P will work with Service Saskatoon and the Communications division to ensure there is consistency between any options chosen and other corporate service alerts.

Internal staff will also benefit from the OMS by having a shared interface and dashboard to input trouble calls and track progress. SL&P staff can see new trouble calls as they come in and receive outage status updates in real-time.

Integration with Corporate Systems

One of the benefits of implementing the OMS supplied by Survalent will be the seamless integration with the Smart Grid Control System recently installed. The initial selection of the Survalent platform envisioned adding this module onto the system to provide more functionality.

Integration with other corporate systems, including the future Enterprise Resource Planning and Customer Relationship Management systems will be possible. Since the OMS provides functionality specific to the electric utility environment, there will be very little overlap with the functionality of those systems and no wasted investment. Simple integrations with the City's existing Customer Information System, Interactive Voice Response, and Service Alerts can be completed readily and plans are already in-place to integrate with the City's strategy for GPS in vehicles.

Options to the Recommendation

A separate Request for Proposals could be re-issued to purchase the system. This option is not recommended as the integration work completed to date between Survalent and other existing systems would need to be duplicated and therefore would not yield an overall lower price.

The annual software maintenance agreement could be paid under a term less than five years. This option is not recommended as this may result in an overall increased system maintenance cost.

Communication Plan

The initial implementation of the OMS will focus on internal systems and does not require a communication plan. As external communication avenues are enabled, appropriate communication plans will be developed. Service Saskatoon and the Communications division will continue to be consulted prior to implementation of new communication channels to ensure a consistent experience for the citizens.

Financial Implications

The net cost to the City for the services as submitted by Survalent would be as follows:

OMS Software	\$212,125.00
5-Year annual software support	<u>130,205.00</u>
Subtotal	\$342,330.00
GST (5%)	17,116.50
PST (6%)	<u>20,539.80</u>
Total Cost	\$379,986.30
GST rebate (5%)	<u>(17,116.50)</u>
Total Net Cost to the City	\$362,869.80

The current annual maintenance fees for the software will increase with the addition of the OMS module. By entering into a five-year software maintenance agreement, SL&P can option better pricing.

Sufficient funding for the OMS is available in the approved 2017 Capital Project #1018 - SLP-Monitoring System Upgrade (SCADA). Funding for the remaining phase and components is allocated in capital plans for the same project through the end of 2020. The Administration will take the appropriate action at that time to award any additional work.

Sufficient funding also exists within SL&P's 2018 Operating Budget to fund the ongoing software support.

Other Considerations/Implications

There are no public and/or stakeholder involvement, environmental, policy, privacy or CPTED implications or considerations.

Due Date for Follow-up and/or Project Completion

Implementation of the OMS is expected to be complete and operational in 2019. Additional phases or components are expected to commence within the following five years.

Long-term plans for SL&P are to continue investing in smart technologies and implement other software modules that further deliver the benefits of the Smart Grid Control System.

Public Notice

Public Notice pursuant to Section 3 of Policy No. C01-021, Public Notice Policy, is not required.

Report Approval

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