Puget Sound Emergency Radio Network: Project Schedule and Cost Risks

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November 10, 2015

Executive Summary

Work to replace the aging Puget Sound Emergency Radio Network (PSERN) is falling behind on an ambitious schedule. The County must finish its work constructing radio towers before the vendor can install new equipment to meet modern standards and expand coverage. The project team plans to expedite construction by using a contract method that carries some increased cost risk. We recommend risk mitigation activities and improved scheduling and reporting to get the project back on track and strengthen accountability.

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King County Auditor's Office
Capital Projects Oversight Program
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King County

Puget Sound Emergency Radio Network: Project Schedule and Cost Risks

Report Highlights

November 10, 2015

Project Status

We have identified schedule and cost risks to King County's $273 million levy funded Puget Sound Emergency Radio Network (PSERN) project. The purpose of this voter approved effort is to upgrade King County's emergency radio network to meet modern technology standards, expand coverage, and replace existing equipment. The current network vendor (Motorola) has stated it will stop supplying replacement parts and repairing used parts for equipment at the end of 2018, resulting in a risk of performance degradation thereafter. The PSERN project team has contracted with Motorola to identify radio tower sites and furnish, install, and test a new emergency radio system and equipment at a cost of $112 million, with final acceptance scheduled for September 2020.

This report focuses on the county-managed effort to lease and construct improvements at 42 radio tower sites needed for the new system. This work must be finished before Motorola can commence their installation and testing work, which is contractually scheduled to start in July 2017.

▽ Scope

The construction portion of the project scope is uncertain, with locations for six radio tower sites to be determined and further evaluation needed to confirm the usability of 14 other sites.

▽ Schedule

Over half of the sites identified by Motorola have not been usable, delaying the county's leasing, design, and construction work since replacement sites had to be located before these tasks could start.

▽ Budget

The current project budget for designing, leasing, and constructing radio tower sites is based on planning-level estimates prepared in 2013. It has not been revised to reflect what PSERN has learned through early lease negotiations and design activities on usable sites.

Recommendations

We make recommendations to update the project schedule, improve reporting, establish a project baseline, and mitigate risks associated with a construction contracting method the County has chosen.

● = No Current Concerns ▽ = Attention Needed ⬢ = Corrective Action Needed

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1. Schedule Risks

Section Summary

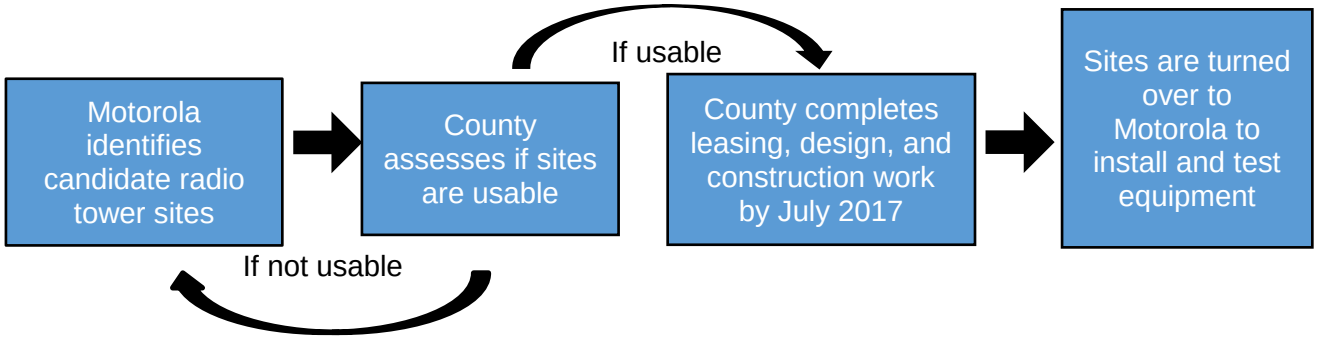
The Puget Sound Emergency Radio Network (PSERN) project has fallen behind on an ambitious schedule to develop tower sites, and it is uncertain if the project team is adequately prepared to manage schedule risks. It is taking longer than planned to locate usable radio tower sites, putting pressure on the July 2017 site readiness date included in the county's contract with Motorola. It is also taking longer than planned to establish a standard form lease agreement intended to streamline lease approval.

Locating usable radio tower sites is taking longer than planned

It is taking longer than planned to identify usable locations for the 42 radio tower sites needed for the county's emergency radio network, which could potentially delay project completion. This puts pressure on the July 27, 2017 site readiness date included in the county's contract with Motorola since locating usable sites is the first step in a tower development process also involving leasing, design, and construction.

Under the terms of its contract with the County, Motorola is responsible for identifying usable tower locations. The project schedule shows this work planned to be completed by mid-May. However, through mid-October, 38 of the locations Motorola identified were found by the County to have unacceptable flaws, such as leasing issues, radio signal problems, and permitting or construction obstacles. At this time, 22 radio tower site locations have been confirmed, 14 locations may be deemed usable after resolving minor issues, and the County is waiting for Motorola to identify replacement sites for six radio tower sites.

Exhibit: Tower construction is dependent on identification of usable sites.



Source: Auditor's Office Analysis of PSERN documents

The PSERN project team reports that the County has notified Motorola about concerns with its performance and that the difficulties experienced with the candidate sites they identified for the county has caused schedule delays.

1. Schedule Risks

The PSERN project team intends to continue working with Motorola to resolve the site identification issues.

The PSERN project schedule is not detailed enough to assess whether it is still reasonable to accomplish the remaining tasks and achieve the tower site readiness date included in the contract given the progress to date. While the PSERN project team has identified actions it could take to potentially mitigate some of these schedule risks, it is unclear when it intends to take action, and whether the actions will be enough to recover the schedule delay. It is also unclear what impact a delay in radio tower construction would have on the rest of the project schedule.

A standard form lease and County Council approval is critical to meeting schedule

The PSERN project team is also behind schedule in its goal to establish a standard form lease for the tower sites to streamline legal review and County Council approval. The standard form lease was expected to be available for the PSERN project team's use in tower site lease negotiation by June 2015. However, review of the standard form lease is still in process. The PSERN team indicates that developing the standard language has taken longer than expected, involving coordination with numerous county entities and outside consultants, including the Facilities Management Division, Risk Management, the PSERN project staff, the Prosecuting Attorney's Office, outside legal consultants, and council staff. Once the standard lease language is available, the project team should plan time for additional legal review of unique lease language in the event that some property owners require revisions to the standard form lease.

The PSERN project team expects to seek County Council approval for the first batch of tower site leases in February-March 2016 and is actively working with council staff to schedule consideration of leases for approval.

Recommendation 1

The Puget Sound Emergency Radio Network project team should revise the project schedule and communicate it to stakeholders before the end of 2015 to include reasonable time to accomplish the remaining tasks necessary to finish tower site construction. The schedule should be based on progress to date and identify the impact on the remainder of the project schedule.

2. Project Accountability

Section Summary

Cost and accountability risks are increased by the PSERN project team's decision to move forward with a construction contract despite having only preliminary cost estimates and before baselining the project. The project team is relying on preliminary, planning-level cost estimates made two years ago for tower construction, which increases the risk costs will be higher than currently estimated. Given this and other decisions, the PSERN project team should establish a project baseline and improve project documentation to provide the county and its stakeholders with the information necessary to measure the scope, schedule, and budget performance of the project.

Project reporting does not facilitate decision-making or oversight

The PSERN project reporting does not provide the County and its stakeholders with up-to-date status information in a format facilitating decision-making and oversight. Up-to-date status information is especially important given the fast pace of the project and level of uncertainty surrounding the scope and cost of the radio tower construction. For instance, the current cost estimate for tower construction is based on planning-level estimates prepared in 2013 and does not reflect what the project has learned from the site selection process, preliminary lease negotiation, and preliminary design work. Planning-level cost estimates have a high level of uncertainty, increasing the risk that tower construction costs could exceed the current cost estimates.[1]

The current schedule and cost reporting that the PSERN project team uses to communicate with project stakeholders and oversight entities does not provide clear and verifiable status updates useful for formulating decisions about certain project elements that are still being worked out. Stakeholder access to clear reporting would also facilitate independent oversight verification that reporting is consistent with more detailed project documentation. This issue has also been identified by the quality assurance consultant retained by the project sponsor. The PSERN project team intends to improve its reporting.

Well organized and verifiable progress reporting would clearly document where actual costs and/or schedules differ from the project plan, show trends, and highlight variances that warrant further attention. Status reporting is especially important given the fast track delivery approach to tower site construction planned for this project and the potential that delays or cost

[1] Planning-level estimates are generally assumed to be uncertain, with actual costs expected in a range from -50 percent to +100 percent of the estimate.

overruns in the early part of the project could impact the overall project outcome.

Recommendation 2

The Puget Sound Emergency Radio Network project team should improve reporting to clearly demonstrate to stakeholders the progress on leasing and constructing radio tower sites. Reporting should show how current cost and schedule forecasts compare to the assumptions used in the preliminary project estimate.

The project team has not established a baseline

The PSERN project team has not yet established a project baseline, creating an accountability risk since no clear basis for evaluating scope, schedule, and budget performance is available. Establishing a baseline for the project scope, schedule, and budget will enhance accountability by providing a performance benchmark that stakeholders and oversight entities can use to evaluate project performance. A baseline is required by county code for capital projects when 30 to 40 percent of the design work is finished.

The Project Review Board, an oversight body for IT projects, does not plan to require the PSERN project team to establish a baseline at this time, because the incremental approach to the design of the individual tower sites makes determining the 30 to 40 percent milestone for this portion of the project work difficult. However, the timing and cost of the Motorola work is now certain and contractually agreed to. The $112 million contract represents 59 percent of the capital expenditure budget for the project.[2] The PSERN project team has also contracted for design and construction management consulting services, providing greater cost certainty in those areas. With the information gained from implementation of recommendations 1 and 2 above and the certainty from the Motorola and other contracts, the PSERN project team should soon have adequate information to establish a baseline.

Recommendation 3

The Puget Sound Emergency Radio Network project team should establish and document a project baseline prior to signing any construction contract. The baseline should use the certainties from the Motorola contract, best available information for tower site costs and schedule, and refined estimates of other costs.

[2] The $273 million PSERN project budget includes $189 million for capital expenditures, $19 million for non-capital expenditures, $38 million for contingency, and $27 million for debt financing.

3. Work Order Contracting

Section Summary

The PSERN project team intends to use a fast track approach known as work order contracting for tower site construction which, while providing greater flexibility, also increases the risk of paying more for construction compared to other contracting methods. The PSERN project team plans to use work order contracting to expedite tower site development by contracting in advance then initiating construction incrementally as leasing, permitting, and design work are finished for each site. This contracting method increases cost risk, especially for the PSERN project, since the estimated construction cost is large, the work complex, and the project team has limited experience using it. For sites on federal land, the process to obtain leases is anticipated to take approximately one year, providing sufficient time to finalize designs before bidding.

Work order contracts provide schedule advantages but increase cost risk

Prior work by our office has shown that while a useful tool, the work order contracting approach the PSERN project team plans to use increases the county's risk of paying more for construction than when using other methods. We published a performance audit on work order contracting on July 7, 2015 and determined this contract type increases the county's cost risk while offering flexibility and schedule advantages.[3]

We found that using work order contracts did not always result in the lowest construction cost. It is especially important that the cost risks of work order contracting are considered and mitigated on the radio tower construction for two reasons. First, if done under a single contract for an estimated construction cost of approximately $20 million, this would be the largest work order contract ever used by the County, with the next largest one being $3.5 million. Secondly, the PSERN project team has limited prior experience using this contracting approach, increasing the cost risk.

The Finance and Business Operations Division (FBOD) approves use of this method and provides technical assistance during procurement. Ongoing assistance with contract management is not usually provided, unless requested by the project manager. FBOD participated in the PSERN project team's decision to use work order contracting for this project. Based on FBOD's involvement with work order contract use across county agencies, it is also in a position to help the PSERN project team manage cost risks. This assistance will be especially important given the scale and complexity of the

[3] Work order contracting entails competitively bidding and executing an overall contract using scope and schedule assumptions. Then when designs are finished and permits are in hand, negotiating a price for each individual work order, such as a tower site, based on pricing information from the bid, where applicable.

tower construction effort and the PSERN project team's limited experience with this contracting method.

Recommendation 4

The Finance and Business Operations Division should provide ongoing technical assistance to the Puget Sound Emergency Radio Network project team to help manage the cost risks of any construction work order contracts for this project.

The project team should consider design-bid-build for select sites

The PSERN project could lower cost risk by using traditional design-bid-build contracting on sites with extensive and complex construction or long lead times to obtain leases. For example, at least four of the tower sites are in remote locations that could involve construction of access roads or using helicopters to deliver equipment and materials. At least one site has an estimated construction cost over $1 million. Costlier or more complex construction work introduces greater cost risk and may require more extensive contractor qualifications than the lower cost or simpler tower sites. Including complex or high cost sites in a work order contract with lower cost and more routine sites could result in increased costs for all of the tower sites in the contract.

Additionally, obtaining leases for sites on federal land is anticipated to take approximately one year. Therefore, the PSERN project team would have ample time to finalize the designs for these sites and procure a construction contractor through a traditional design-bid-build process, avoiding the cost risks of work order contracting without schedule implications.

The benefits and risks of using work order contracting rather than a traditional design first, then bid approach varies for each of the tower sites. The PSERN project team is gaining an understanding of the work needed at each site and FBOD procurement staff has extensive experience with the use of both contracting approaches. This collective knowledge equips them for assessing contracting choices for each disparate site.

Recommendation 5

Before seeking bids on a work order construction contract for the radio tower sites, the Puget Sound Emergency Radio Network project team and Finance and Business Operations Division should evaluate the relative benefits, costs, and risks specific to each site of inclusion in a work order contract or a traditional design-bid-build contract. This evaluation should be documented and result in a recommended approach for each individual site for consideration and approval by the project sponsor.

3. Work Order Contracting

Conclusion

This report focuses on one critical element of the PSERN project and is intended to provide timely recommendations as the project moves forward on construction procurement in the next few months. Our future reports will cover our oversight on the full scope of the PSERN project, including progress on installation and delivery of the radio equipment by Motorola.