Power System Engineering, Inc.

Proven Approach for Complex Technology Procurement

By Power System Engineering, Inc. (PSE)

Mitigate costly procurement missteps by establishing a clearly defined process.

Introduction

The procurement of technology is a complex process that requires the consideration of numerous factors and dependencies within an organization. In our industry, technology is constantly evolving to keep up with industry changes and customer expectations. Major software systems are used cross-departmentally, requiring seamless integrations and varying user interfaces. By establishing a clearly defined procurement process, a utility can mitigate costly missteps and ensure that well-informed, strategic technology decisions align with your critical infrastructure planning.

Common Procurement Challenges

Lack of Technology Synergy or Roadmap

A recurring challenge for utilities is determining the best sequence in which to procure and deploy new technologies. A single technology or program often supports, or requires support, from other technologies. Making a procurement decision without first considering crucial dependencies can result in a poorly timed deployment or have a domino effect of issues with other systems and integrations. For example, investing in a new AMI system without first deploying the appropriate communications infrastructure required to support it would result in a largely unusable AMI system.

Understanding the best order in which to procure systems is as important as knowing which systems to procure.

A clearly defined project plan supported by all departments and stakeholders is vital for technology procurements. Without an overall roadmap for the entire utility, individual departments are prone to procure technology without determining synergy with other departments, resulting in a "siloed" technology architecture and making any system integrations more difficult to achieve.

Visibility across multiple departments can help fully realize the benefits and added value of the technology for the entire organization. Beyond the benefits and value of the technology, a clearly defined project plan includes assessing required staff resources, notification and preparation for technology and process changes, identification and mitigation steps for potential risks, and properly budgeting the capital and recurring costs.

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You can not expect to receive qualified RFPs if requirements and specifications are not clearly defined.

Request for Proposals (RFP) Missteps

A poorly developed RFP can cause major issues from the start. If the RFP does not clearly define requirements and state detailed specifications and expectations, you cannot expect to receive qualified responses. Instead of comparing "apples to apples," your utility will have to wade through varying responses – or "apples to oranges."

For example, in procuring automation software, a utility might answer the following questions prior to issuing an RFP: Should vendors provide Oracle or SQL databases? Should vendors quote costs for the database license? Should vendors quote costs for a cloud-based or premise-based software solution? If some vendors bid cloud-based and others premise-based, how would the different maintenance costs be accounted for during the bid review process? The answers to these questions, which highlight important requirements, are essential for the RFP.

Inappropriate Vendor Influences

Allowing a vendor or multiple vendors to have influence over the procurement process can be detrimental to an effective technology decision. It is important to maintain fair and equal communications, keep an open mind, and avoid premature vendor preferences. If an employee is already biased toward a certain vendor, it is likely they are not considering the potential benefits of other solutions, which could offer the same or more.

Avoid the perception of any preference by having no contact with vendors during the bidding process other than to respond to questions and issue addendums, which should be sent to all participating vendors at the same time. This also includes not participating in vendor user conferences or one-on-one meetings during the bid process.

Poor Contract Negotiations

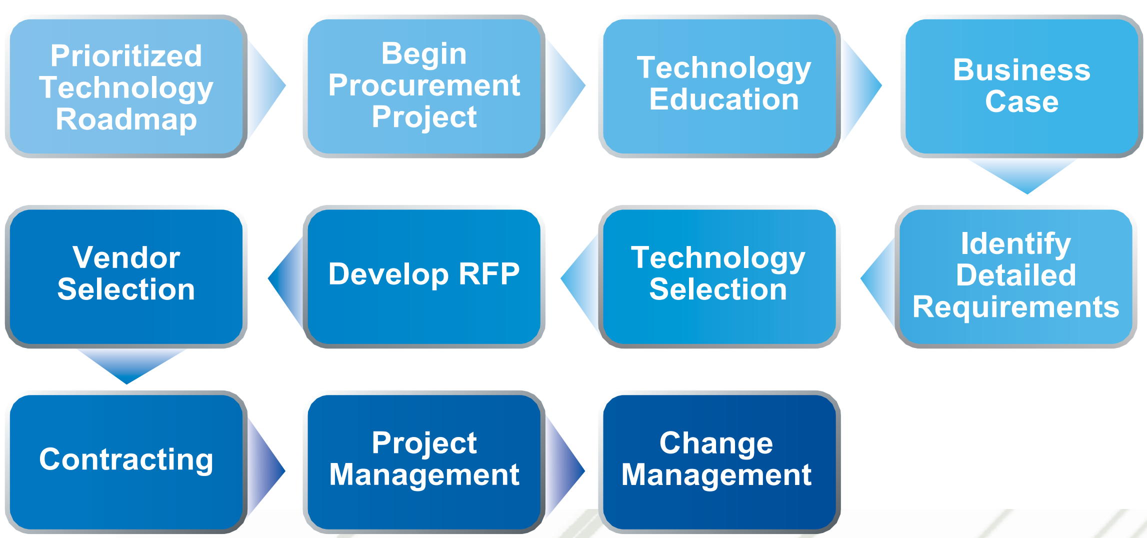
A utility that lacks specific experience with the technology being procured is at risk of agreeing to terms and conditions that are not in their best interest during the contract negotiation process.

For example, an individual who has negotiated several SCADA contracts and procured millions of dollars in substation equipment is likely a knowledgeable and experienced negotiator in this area. However, if the same individual is asked to procure a mobile radio system, which has a completely different set of requirements, vendors and risks, they might be ill-equipped to develop and negotiate this type of contract. Having a resource with a thorough understanding of the new technology and potential deployment risks would be strongly preferred.

Procurement Process

By following a proven, professional process for all technology procurements, a utility can save money and staff time, reduce risk, and ensure that they select the right solution for the right price to meet its business needs.

PSE's Procurement Process



The following describes these procurement process steps in further detail.

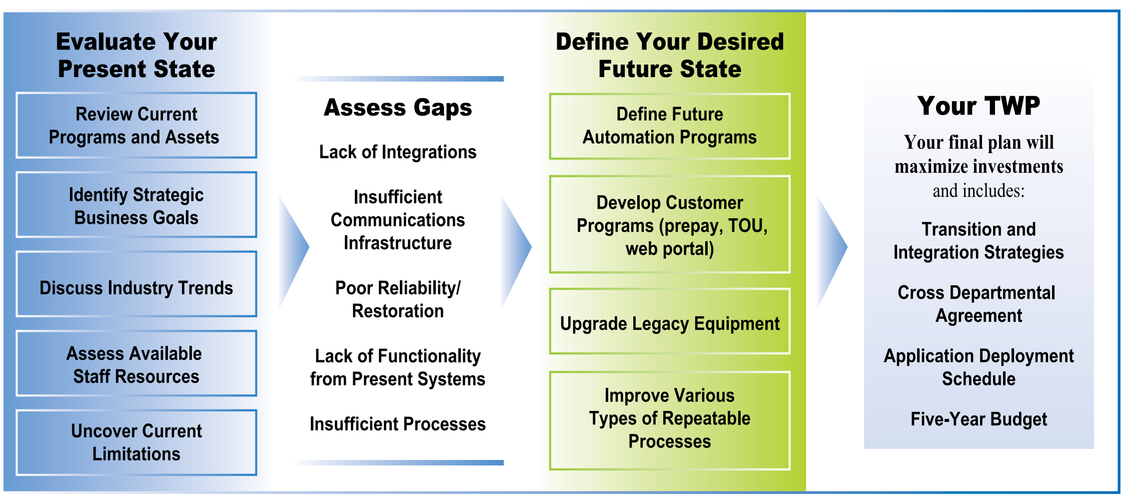
Finalizing a TWP should come prior to procurement and is the first step in determining the most appropriate technology to procure.

Step 1 Develop an Overall Technology Roadmap

Create a technology work plan (TWP) or roadmap by taking a step back and assessing the current technology situation and gap areas. Finalizing a TWP should come prior to procurement and is the first step in determining the most appropriate technology to procure, and in what sequence.

With the roadmap in hand, a utility can more easily define and prioritize its desired future state.

PSE's Technology Planning Process



Once a technology roadmap is developed and agreed upon by all departments, the utility is ready to begin procurement.

Step 2 Begin Procurement

In beginning a technology procurement project, there are a number of questions that need to be addressed prior to getting started. These questions will vary depending on the technology or program being procured, but will likely consist of some of the following:

1. Is the project team committed to and in agreement on a common objective?
2. Are the leading program/technology vendors known?
3. Is education required on the program/technology?
4. Have the necessary technology-level decisions been made?
5. Has the project been pre-approved based on a budget?
6. Has a deployment schedule been set?
7. Are the necessary staff resources available for procurement and a subsequent deployment?

The answer to these questions could impact the approach and timing of the procurement project going forward.

Step 3 Provide Technology Education

An educational overview session on the technology being procured allows the project team to be fully informed as they enter into the procurement process. This session should cover a comparison of the different technology options available, a review of the benefits and risks, existing and future trends, viable vendors, challenges faced by other utilities, and the causes of poor deployments. The project team also develops preliminary requirements, which will eventually go into the RFP.

Education early in the procurement process has recently become even more critical. For example, a utility that is in need of a new SCADA system might also be interested in procuring a Distribution Management System (DMS). Or perhaps following the SCADA deployment, they also want to make improvements to their Outage Management System (OMS). In order to best execute these procurements, the utility needs to have a comprehensive understanding of its options. This means comparing the product capabilities of a suite solution that provides a SCADA, DMS, and OMS within one integrated system, and a best-in-class solution that ties together separate, independent vendors.

While there is no right or wrong approach to this key technology question, having the procurement project team understand the pros and cons of every option prior to creating the RFP and deployment plan is imperative to making a well-informed decision.

Continued

Step 4 Complete a Business Case

If a utility is unsure of whether to move forward with a technology procurement, performing a business case will further verify of the projected costs and benefits. When a business case is done prior to procurement and the formal proposed bids come in as forecasted, then the managerial approval process is generally much easier.

PSE completes a business case by gathering specific information related to costs and business processes. These inputs ultimately become the assumptions in the cost/benefit analysis of our proven business case model.

Sample AMI Business Case Output

	Net $ Benefit with AMI			
	Annual Benefit		Accumulated Benefit	
Year	Current $	NPV (2008 $)	Current $	NPV (2008 $)
0	$0	$0	$0	$0
1	50,803	48,615	50,803	48,615
2	35,237	32,267	86,039	80,882
3	(30,486)	(26,715)	55,553	54,168
4	($3,658)	($3,068)	51,895	51,100
5	24,605	19,744	76,500	70,844
6	55,748	42,809	132,248	113,653
7	90,340	66,384	222,588	180,037
8	128,213	90,157	350,800	270,194
9	169,012	113,729	519,812	383,923
10	214,139	137,890	733,951	521,813
11	264,174	162,783	998,125	684,596
12	319,181	188,209	1,317,306	872,806
13	351,637	198,419	1,668,943	1,071,225
14	451,087	243,575	2,120,030	1,314,799
15	558,244	288,456	2,678,274	1,603,256
	$2,678,274	$1,603,256		
			Annual Discount Rate for NPV =	4.5%

Step 5 Identify Detailed Requirements

Identify requirements for a new system by first baselining present functionality. What are your current capabilities, what is working well, what is not working as expected, and what features are desired for the future. The table below shows a sample portion of a PSE worksheet used to baseline a CIS system.

CIS / FIS Present and Future Functionality				
	CIS / FIS Product Attributes	Current CIS Delivers? (Y or N)	Available but not Deployed (Y or N)	Desired to Have in Future? (H, M, L)
	CIS General Functionality			
1	Supports energy assistance programs			
2	Provides Coding Accuracy Support System (CASS) certification			
	CIS Data Storage			
3	Maintains current account number system and historical member activitiy (*e.g., consumption and payment history*)			
4	Supports a single master account with multiple sub-accounts per customer hierarchy (*e.g., the ability to aggregate account changes and create groups*) even if the master does not have a premisis in the utility service area			
5	Master accounts support total relationship management including summary account handling and repsonsibility for sub-accounts recievables. Sub-accounts can be easily associated/disassociated with a master account			
	CIS Employee/Customer Web Portage Functionality			
6	Supports full viewing of all account information associated with an address or master account, including usage history (*1-2 yrs*), usage analysis (*by meter and aggregated*), notifications, current bills, alerts, and payment history in a dashboard view. Also allows for online bill calculation in real-time.			

In addition to being documented, requirements should be prioritized and weighted depending on what is most important to the project team and the utility as a whole. In completing the baselining exercise, a strategic vision for the future will begin to take shape.

Requirements should include functions and features of the system, as well as the required integration use cases and methods (e.g., MultiSpeak), and reporting needs as they relate to other systems. When an existing vendor and a new vendor both have a software integration role, it must be clearly defined. Making the false assumption that a certain vendor will take responsibility for the integration of two systems is a common mistake.

While many functionality area integrations are expected to be provided by the new vendor, it still needs to be clearly defined in the RFP. It is common for two similarly-sized utilities with the same set of vendors to deploy functionality and integrations differently. These differences could be the result of an RFP with poorly defined requirements, or the utility simply opting to not implement certain features or integrations.

Step 6 Select Technology

Making technology-level decisions prior to issuing the RFP helps create a tightly written document. An example of a technology selection for a utility looking to implement an AMI system is the decision to procure a PLC, mesh wireless, or point-to-multipoint solution. Another example would be whether a given microwave link should use an unlicensed radio or a licensed spectrum and what specific technology to use for each individual path. Deciding if the utility should establish a best-in-class or suite-integration approach could also be a technology-level selection.

During the RFP response period it is important to maintain professional and unbiased communications with the vendors.

Determining the best technology options require a detailed review of the pros and cons of each, the utility's requirements, and possibly a more focused cost/benefit analysis. Other factors like product lifecycle, industry trends, and available vendors will also impact the technology decision. By making these determinations up front, the RFP will have a more accurate focus on vendors who offer what the utility is looking for.

Step 7 Issue an RFP

The key purpose of issuing an RFP is to gain a comprehensive understanding of available solutions, solicit competitive quotes from select vendors, and establish a contract with appropriate terms and conditions that will benefit the utility long term. The RFP should include the defined list of requirements for vendors to indicate compliance and provide additional comments, terms and conditions, a deployment schedule, responsibility matrix, system acceptance test plan, pricing sheet, and various other components depending on the technology being procured. The final document should be sent to a pre-determined selection of viable vendors.

The following is an example of what might be included in a Land Mobile Radio (LMR) RFP.

LMR RFP Sample Table of Contents	
1	**Project Overview and Objectives**
2	**RFP Information and Instructions**
3	**Schedule**
4	**Proposed Design and Requirements**
5	**Responsibility Matrix**
6	**System Testing Requirements**
7	**Utility LMR System Data**
8	**General Terms and Conditions**
9	**Pricing**
10	**Exhibits and Attachments**

If needed, there are additional steps that can be taken to learn more about the vendor environment. A Request for Qualifications (RFQ) can be issued if a utility is unsure about which vendors are qualified to meet its needs. A Request for Information (RFI) can be issued when further education is needed on specific technologies and vendor offerings. An RFI can also include a request for non-binding budgetary costs.

During the RFP response period it is important to maintain professional and unbiased communications with the vendors. This means making all materials and information available to all participating parties and not giving an unfair advantage to any specific vendors.

Step 8 Select Vendor(s)

RFP responses must be assessed and compared carefully using a uniform scoring methodology. Key criteria should be weighted heavily compared to those aspects that have little impact on the solution.

The following table is a sample summary comparison of responses from three different CIS vendors working towards short-listing the final two vendors for further consideration.

Sample RFP Response Comparison and Scoring

Evaluation Score: 1 - Very Poor 2 - Poor 3 - Acceptable 4 - Strong 5 - Very Strong

Category	Vendor 1	Vendor 2	Vendor 3
Pricing (Base System)	$999,625	$1,200,000	$1,900,000
Pricing (5 Year Total Cost: Base System plus 5 Year Recurring	$1,527,690	$2,800,000	$3,100,000
Pricing Notes	Lowest base cost and cost per year maintenance	Fair licensing, engineering, and on-going maintenance costs	High on-going maintenance. Understand the cost.
Technical Question Responses	**5** - Very strong product in most areas. Highly configurable and functional. Some limitations in prepaid metering and billing platform.	**4** - Overall strong product with specific limitations. Strong customer interface and mobile app.	**4** - Very good product. Concerns about references for parts of customer portal.
Integrations	**3** - OMS interface description references high availability of customer acct. data.	**4** - 10+ years experience integrating with current system. SCADA and AMI interfaces MultiSpeak. IVR well understood	**4** - SCADA, GIS, AMI solutions reasonable. Good IVR experience
References and Experience	**4** - Offered four good cooperative references.	**4** - Offered four cooperative references of similar size.	**4** - Offered good references both larger and similar in size.
Maintainability / Support	High on-going support based on annual maintenance cost.	Believed reasonable based on other vendor interactions, but should be verified	Should explore on-going maintenance cost and what support is required
Vendor Size Fit with Utility	**3** - Uncertain. Would want to talk with references about whether vendor fit their size well.	**4** - Good size company willing to adapt product as needed for market.	**3** - Good size company to be responsive but cost may be high for the service.
Recommended Vendor Demo	**NO**	**Yes**	**Yes -** Integration Exp.

After reviewing the RFP responses, we suggest narrowing down the vendor field to two or three shortlisted vendors. These vendors are then invited to provide onsite demonstrations of their solutions. During the onsite meetings the utility has the opportunity to ask questions and see the technology perform first hand. Following the onsite vendor days, the project team can make a confident and well-informed vendor decision.

Continued

Step 9 Negotiate the Contract

Once the project team is in agreement, the selected vendor is notified and contract negotiations commence. It is unlikely that a vendor will accept the terms and conditions as is. Typically, vendors suggest modifications, and some request that their own contract document be used as a starting point. By asking vendors to redline or comment on a draft set of terms and conditions as part of the RFP, the contracting phase will be more efficient.

When negotiating costs, the total cost of ownership needs to be considered. An inexpensive product can end up being costly if the carriage costs or maintenance fees are high. The competitive bidding that goes on during the RFP process often results in more favorable terms and conditions for the utility.

Step 10 Manage Deployment

Individuals managing the technology deployment must always be aware of the "big picture" objectives. The project manager must base their direction on clearly documented costs, schedules and goals, and be supported by a motivated and well-informed team.

Other duties of the deployment project manager include maintaining quality targets, managing risks, responding quickly to problems, leveraging team skills, keeping to the schedule and milestones, watching the budget, managing contracts, and most importantly maintaining strong and timely communication with the vendor and project team.

New technology deployment often includes more than one vendor. For example, during an OMS deployment, an IVR is sometimes deployed concurrently, which requires integrations with SCADA and AMI vendors, and could also involve an Enterprise Service Bus (ESB) vendor. Typically each vendor will have its own project manager involved. However, the utility can ensure communication is maintained and deliverables are properly managed across the various teams and departments by using an overall master project manager.

Step 11 Manage Change

When new systems and programs are deployed (e.g., AMI, OMS, prepaid metering and other smart-grid applications) it is often necessary to make business process changes in order to take full advantage of new capabilities. In general, software vendors are not responsible for overseeing a utility's process changes and often these changes are not included in the deployment plan, therefore failing to address a key component of a technology deployment. To account for this, every procurement project should allocate resources to facilitate "change-management" opportunities during the deployment phase.

Procurement Best Practices

While the preceding steps describe a typical procurement process, each project and technology is unique and might require different approaches to allow for certain exceptions. As a best practice, a utility should develop procurement policies to determine which process should be followed based on certain criteria, such as:

1. Cost thresholds for technology purchases
2. New technology vs. add-ons to existing systems or replacements for retired technology
3. Procurement risks
4. Existing knowledge and understanding of technology being procured

Examples of processes that might be followed based on this criteria could include the following:

1. Purchase from pre-approved supplier (low dollar amounts)
2. Sole source or "no bid" (only one known source can provide goods or services)
3. Single source (while others may exist, only the designated supplier is acceptable, e.g., add-ons to an existing SCADA system)
4. Competitive bid (multiple suppliers are acceptable)

Create an overall technology roadmap before jumping into procurement.

Develop a Technology Vision

As stated in Step 1 of PSE's procurement process, it is best to create an overall technology roadmap before jumping into a procurement project. A key part of developing the roadmap involves identifying long-term strategic objectives in order to create a technology vision for the future.

Depending on what is important to the utility and its members, strategic objectives can stem from various drivers including the following:

- **Reduce costs**
- **Improve reliability and customer service**
- **Improve productivity**
- **Enhance security**
- **Revamp utility image via customer engagement**

Once the objectives and drivers are identified and prioritized with cross departmental buy-in, a deployment roadmap can be developed to address them. If a utility is unsure about a certain program, further education, gap analyses, and cost/benefit feasibility analyses are useful assessment practices.

About the Author

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Rick leads PSE's automation and communications technology group with more than 30 years of professional experience. Rick and his staff provide consulting and engineering services to utilities, including: technology work plans, strategic communications plans, procurement, design and project management of SCADA, DA, substation automation and design, AMI, demand response, CIS, GIS, MWM, AVL, OMS, and asset management. Communication area services include land mobile radio, fiber and microwave backbones, and mobile data. Rick earned his MBA from Cardinal Stritch University, Milwaukee, WI.

Contact Rick at 608-268-3502 or schmidtr@powersystem.org with any questions you might have regarding PSE's procurement process.

Power System Engineering, Inc.

Full-service consultants

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PSE is a full-service consulting firm. Our team has extensive experience in all facets of the utility industry, including communications, IT, and smart grid automation planning and design; economics, rates, and business planning; electrical engineering planning and design; and procurement, contracts, and deployment.

We are employee-owned and independent, which gives our clients confidence that we are motivated to satisfy their needs and represent their best interests.

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