Electric Utility Benchmarking Assessment
For
Dover Electric Utility

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Section 1. Executive Summary

This section provides a high-level summary of the findings of the Electric Utility Benchmarking Assessment for the City of Dover Electric Utility.

The City of Dover Requested a Benchmarking Study for Its Electric Utility

The City of Dover sought a firm to provide organizational assessment and benchmarking services for its electric utility. Included in the scope of work was a review of each functional area within the utility as well as the development of alternative organization constructs for Dover Electric Utility to consider.

Avant Conducted a Comprehensive Review of Dover's Electric Utility

Over the past three months, Avant Energy, Inc. (Avant) has conducted a comprehensive review of Dover's electric utility operations. The review included discussions with city management, on-site meetings with electric utility personnel, contractors, and other city employees that interact with the electric department. Avant also examined financial information related to Dover's electric department against peers and competitors. Other pertinent information such as planning reports, vendor contracts, and legal analyses were reviewed.

Dover's Electric Department Has Experienced Turnover

Dover's electric department has experienced a slightly higher than average level of utility personnel turnover. Most importantly, the electric director position is currently vacant.

Hiring a New Electric Director Is a Top Priority

Hiring a new electric director should be the top priority for Dover. Avant is currently assisting Dover identify and recruit electric director candidates. This report is intended to provide a number of recommendations that can be implemented by the new electric director.

Electric Utility Issues Fall into Five Key Focus Areas

We have grouped our analysis of the issues facing Dover's electric utility into five key focus areas:

- Standardized Process and Procedures
- Systems
- Training and Development
- Staffing
- Communication

These five areas are discussed in detail in Section 3.

Avant Reviewed Utility Financial Information

Avant reviewed Dover's utility financial information as part of the benchmarking process. Specifically, our analysis presented in Section 4 was focused on the following areas:

- Rates and Competitive Position
- Inventory Levels
- Reserve Account Balances

In general, Dover's rates are relatively low compared to most peers and competitors in Delaware. However, the electric utility has a high level of inventory per unit of revenue compared to other utilities in the region. Finally, Dover's reserve fund balances are strong and above the target levels established for each specific account.

Four Organizational Constructs Are Presented

Section 5 of this report presents four alternative organizational constructs for Dover's electric utility. These constructs explore how management responsibility for various functional areas could be grouped. A discussion of the benefits and risks of each alternative structure is also presented.

Prioritized Recommendations Should Improve Electric Utility Operations

Implementing the prioritized recommendations within this report should increase operational efficiency within Dover's electric utility, helping it become an organization utilizing best practices and contributing to the entity's long-term success.

Section 2. Utility Leadership

This section provides a summary of the recommendations related to utility leadership based on Avant's meetings and other communications with Dover personnel.

Leadership is the Key to Successful Operation of the Dover Electric Utility	Leadership sets the tone for the electric department and is responsible for running the business in alignment with the vision and strategic imperatives of the city council and city manager. However, the city manager's leadership team (which includes the Electric Director) is largely responsible for execution of the mission and objectives of the electric department. Collaboration, communication, and clear alignment with the city manager is critical for goal achievement to occur in a unified manner.
Workforce Personnel Assessment Would Provide Useful Insights	A comprehensive personnel assessment to evaluate the collective strengths and weaknesses of the existing electric division workforce would be very helpful in determining the leadership skills needed to positively impact the organization. This would include assessment of competency, skill, knowledge, attributes and other factors useful in building cohesive, productive teams. This would allow Dover to better match leadership skills and attributes of the current/future leaders with the needs of staff. Leadership development training and employee training should reflect the gaps identified in the assessment. It is important to communicate the benefit of such an assessment as a tool to better position the utility for future success and not as a tool to highlight individual employee weaknesses. Assessment results could also be used to help create appropriate training and development programs for staff and managers.
The Lack of a Permanent Electric Director Has Led to Performance Breakdowns	When a leadership vacancy or gap exists, as in the case of the Electric Director, breakdowns in the execution and quality of performance delivery are common. The length of vacancy in the Electric Director position can have exacerbating effects on overall performance and quality levels.
Electric Director is Crucial to Developing Culture within the Electric Utility	Turnover at the director level has made it difficult to create a cohesive culture. The lack of consistent and clear communication, along with minimal guidance and work direction, is apparent. A culture of collaboration with teams working seamlessly together at high levels of performance and quality is desired. The new electric director should instill this desired culture at the utility.

Electric Director Should Have a Well-Rounded Skillset

The hiring of a new Dover Electric Director is currently underway, and a position description has been posted on multiple job websites to recruit candidates. A balance of technical, business, and people skills is needed in the new Director. A strong people leader who can operate as a conduit between the electric division and the city manager is imperative. A new Electric Director is critical to stabilize the department and to drive the necessary changes required to not only operate effectively today, but also to prepare the way for the future.

The New Electric Director Would Need to Drive and Reinforce Change in Key Areas

Hiring an Electric Director is the top priority for Dover's electric department and would have the greatest impact on the overall stability and performance of the utility. While there are many areas that the Electric Director would need to address, the following areas are suggested to be addressed first, as they may have the greatest impact on the overall operations if driven and led effectively by a new director:

- Culture and team cohesiveness
- Standardized processes and procedures
- Systems and systems integration
- Staffing
- Training and development (onboarding, new employee, on the job, existing employee - job specific, cross training, individual, team and leader development)
- Communication

These areas are often interrelated and most certainly have a culminating effect on the overall operational effectiveness and quality of the utility. The Electric Director is the key leader, along with those who have leadership responsibilities in the department, to intentionally and collaboratively make these things happen. Because of interconnected nature of these facets of the business, when any of these aspects are deficient, the organization is like a chain with missing links or links that are about to break – which can have serious consequences.

Section 3. Evaluation of Utility Operations

This section outlines recommendations for improving the operation of Dover's Electric Utility based on Avant's review of key documents and one-on-one interviews with Dover Electric Utility staff. Section 3 is broken down into the following sub-sections:

3.1 – Key Focus Areas
These are the key focus areas that apply to all departments within the Dover Electric Utility. Recommendations within each department are categorized by key focus area.

3.2 to 3.6 – Specific Dover Electric Utility Departments
The recommendations related to each department are based on industry best practices amassed from the Avant team's decades of utility operations and engineering experience. Recommendations are listed by priority order within each focus area.

3.7 – Indirect Service Centers
This section assesses how the City of Dover's indirect service centers interact with the Electric Department. Indirect service centers analyzed in this report include:

- Customer Service
- Procurement
- Finance
- Information Technology (IT)
- Human Resources (HR)

3.1 Key Focus Areas

Avant has identified the following five key focus areas through our review of Dover Electric Utility. Detailed recommendations related to each of these key focus areas are listed by department following Section 3.1.

Standardized Process & Procedures	Many processes and procedures should be standardized and documented throughout the utility. Some of these processes are known by certain employees and simply need to be documented and institutionalized. Other processes and procedures seem to be handled differently by different employees and need to be standardized throughout the organization. Leadership follow-up is necessary once processes and procedures are defined to ensure that the processes and procedures are being followed and reinforced. Standardization also requires clear communication of the processes and procedures on an ongoing basis. It is more likely to be effective when benefits of the protocols are communicated to all who use them. Timely, consistent and "standard" training of staff is essential for adherence to occur. Standardization is crucial to complete before implementing new systems to make processes more efficient. Leadership is at the core of implementing this key aspect of improvement.
Systems	There is a need for systems to better optimize workflow and to track the results and efficiency of completed work. The primary system need is for a Computerized Maintenance Management System (CMMS). A CMMS helps with management and execution of tasks by allowing staff across departments to create work orders, to generate tasks, and to track completion. The CMMS would also allow for scheduling of future work, automated reminders of future work, tracking of system condition and inventory, and better estimates for completion time of certain tasks. Examples of CMMS software include MP2, Maximo, and MVP Plant. The integration of the future City of Dover ERP system would also be important to ensure consistent flow and documentation of information. Because the full rollout of the ERP is still in process, we recommend identifying ways to start implementing solutions today that would reduce manual touchpoints and that can be easily incorporated or ported into the ERP system. Leadership is needed to ensure that system enhancements occur, are communicated, are trained effectively, and are integrated throughout the electric department.

Training and Development

Training and development needs differ by department, and in most cases, differ by role type and employee readiness. Training and development of staff is needed throughout the "life cycle" of tenure with the organization.

Training: Consistent and timely training is not only provided through the HR department when someone is hired (benefits, employee manuals, compensation) but just as importantly, training is needed when starting a new job or when promoted to a different job in the organization. A training program, informal or more formal, sets the foundation for new employees to start off with the critical knowledge, information and practical demonstration of the work they would be responsible for in the context of "how we do things" in this organization. Providing standard and consistent training also leads to team and culture cohesiveness and allows for more accurate ways to develop employees and manage performance. It also develops a common language to help ensure more clear and effective communication when employees have a common training base.

Consistent training for employees relies heavily upon the skills and knowledge of the subject matter experts (SMEs) and leaders providing the training. It is recommended that on-going training occur for existing employees and leaders in order for anyone training to provide continuity and consistency of learning. Processes, procedures, and systems all need to be used in the training process. Learning from the legacy knowledge that currently exists is useful but not sufficient. Based on our review it appears that existing employees, leaders and SMEs are provided limited opportunities to learn new skills, methods of efficiency, and knowledge that are critical for optimizing operations. Without training, variations in performance, application, and interpretation are common and result in errors and inefficiencies. Consistency of training allows for clearer communication of expectations, making it easier to hold employees accountable and manage employee performance more accurately. It is recommended that a training program be developed for new and existing staff as well as for leaders.

Training is often the bedrock of the development process for employees. Without adequate training, employee development is limited. Effective training can also reinforce the goals and objectives of a department or organization.

Currently, there is minimal employee or leadership development in Dover's electric department.

Training and Development

Development: Like training, development is a collaborative effort with HR, but the responsibility to drive employee development rests with the departmental leader. Having a development process is an important part of ensuring that continuity and expertise continue to be shared and expanded to best meet the current and future needs of the organization. A development process is also the single most common source for creating a robust talent pool from which to promote people from within an organization. It is a foundational piece to any succession planning efforts.

It is recommended that a development program be put in place to ensure that the maximum return on training is being realized through the ongoing support and accountability of a development plan. A development plan is not simply a performance improvement plan. It is designed to develop people to maximize potential and contribution. Plans can be relatively simple and concise. The development goals need to be clear, actionable, measurable, timely, and relevant to their work.

Development plans are different for new employees than existing employees and should be individualized to the person. Leader development can use the same process but may utilize different methods; such as, coaching, mentors, and specific leadership networks. In each case, there is accountability on both the leader and the employee side for the success of the development. Development can be very cost effective, and it can be used to cross train people or improve their knowledge or skill sets by shadowing or working with more expert staff members.

Development, if desired to be used for succession planning, contains a periodic review of individuals and leaders which looks at their strengths, weaknesses, retention risk, contributions and potential roles they may be able to perform in the future. This assessment can be used for their future development planning activities.

Staffing

Each department has its own staffing needs and challenges. We mainly focus on identifying ways of measuring staff productivity in each department rather than defining the right number of staff at this point. As Dover implements better work tracking software as discussed above, it would be easier to determine appropriate staffing levels through leveraging the data generated by the system. Key indicators that staffing levels or staffing *types* (roles needed to best deliver the services of the department) may not be adequate often show up in turnover rates, worker's comp claims, overtime, and error rates.

Staffing

Staffing also includes looking at alternative ways to perform work of the department that could include selective outsourcing or part-time employees to reduce backlog or provide specific project support. Dover may also want to consider the use of interns, which can perform lower level activities at a relatively low-cost, freeing up higher-paid workers to perform higher value work. Interns can also perform work that needs to be done but is not within existing staff capacity. Interns also provide a pool of potential recruits for future job openings.

Staffing needs to be looked at holistically in the context of immediate need, balanced with the longer-term strategies and goals, as well as succession planning for the workforce needs of the future.

Communication

The main purpose of communication is to transfer information from a person or group of people in one part of an organization to another. It is like a highway that runs horizontally, vertically, internally, and externally throughout the organization. Communication is used to convey information and messages needed for the organization to operate effectively and for people to be able to perform their work. When communication is clear, it helps increase employee engagement, productivity and morale.

Clear communication would help the electric utility function smoothly going forward and would help all employees see the central goals and reasons for change. Clear communication should reinforce key messages such as why Dover needs to standardize processes and procedures. Communicating "the why" and not just "the what" is important to ensure that employees see the long-term benefits of process changes and not just the additional work in the short term. It is also important to communicate differently by department to target the messaging to each group. In some cases, we recommend looking at ways to improve inter-departmental communication and develop opportunities to create feedback communication channels between staff and leadership.

The manner in which information is shared is also important in communication, as it can convey trust or mistrust. Trust is core to a healthy organization. Frequent and timely communication from a trusted source is a way to help build a strong organizational culture and productive environment.

The new electric director needs to have effective communication in order to build a unified and effective team. Equally important to communication is the ability to demonstrate listening skills. Alignment of message with the city manager and council is also essential.

3.2 Transmission and Distribution

This section contains recommendations for the Transmission and Distribution department. Below is a departmental summary followed by detailed recommendations within each key focus area.

Linemen Are Committed to Public Power	Linemen are connected to the mission to keep the lights on, but are less enthusiastic about working for the City of Dover as an entity. The next Electric Director should focus on building upon the positive aspects of the culture of the department to inspire commitment to Dover.
Crews Feel Disconnected to City Level Decisions	Linemen feel that the work they do on a daily basis is not connected to the decisions being made at the city. For example, linemen feel in the dark about the potential sale of the utility and what that would mean to them. They feel that decisions made at the city level are not well communicated.
Lineman Work Needs More Organization and Review	Better systems are needed to track necessary work orders and results. This would help to ensure that well-defined policies and procedures are followed appropriately. These systems would also provide more insight into worker efficiency and may lead to more standardization and consistency throughout the department.
Future Electric Director Should Work with T&D to Institutionalize Department Knowledge	There is a vast amount of knowledge held by the linemen at the Dover Electric Utility. The next Director of the utility should work to ensure that linemen are documenting this knowledge and institutionalizing it so that new linemen can easily learn the systems and to ensure that no knowledge is lost when linemen retire or leave Dover.

Standardized Process & Procedures

Review Justifications for OH to UG Lines Projects	Today, overhead to underground conversions are pursued based on poorly performing reliability areas, which are ascertained by compiling work orders. There doesn't seem to be any standardized cost justification compelling these projects to be completed. It seems this is deemed as "good work" to keep the crews busy more so than being a results-driven initiative. We recommend reassessing the drivers behind this work and the associated benefits. Outside studies suggest that UG conversions are not typically cost justified. One of the most comprehensive reviews is the Edison Electric Institute's summary of previously completed studies on undergrounding published in January 2004. Some of EEI's main findings are:

- Burying overhead power lines would cost about 10 times what it costs to install overhead power lines.
- Underground power systems have fewer outages, but the outages last longer.
- Reliability benefits associated with burying existing overhead power lines are uncertain and in most instances, do not appear to be sufficient to justify the high costs.

Additionally, EEI's report provides summaries of innovative programs that communities and local governments have adopted to help pay for burying their overhead power lines. These include special assessment areas, undergrounding districts, and state and local government initiatives. Investigating opportunities to reduce the cost burden of these projects to the entire Dover customer base is recommended.

A review of whether Dover should continue overhead to underground conversions as systematic work is a high priority item. Hard costs and benefits (O&M comparison, quantifiable reliability improvement, downtime costs, etc.) and soft costs and benefits (aesthetics, customer satisfaction, economic development, etc.) should be weighed so that a value assessment can be performed for each proposed project.

Develop an Emergency Restoration Plan

Dover urgently needs an Emergency Restoration Plan. Dover needs to develop written restoration procedures that take into consideration Dover's existing outage management process, employee handbook, and CBA guidelines. Dover should engage outside support to develop and establish the emergency restoration plan. This plan should include "mutual aid" assistance from regional utilities.

Determine Major Maintenance Emergency Stock Levels

Removal of emergency stock was a prevalent complaint among the line personnel, which they claim is contributing to material shortages during storms. Dover should establish an emergency stock level that is designated as such and considered "untouchable" for everyday material needs. The emergency stock level should be considered as a part of Dover's emergency restoration plan.

Distribution Construction Standards Should be Updated

There are no updated construction standards that are followed. An old copy of the RUS standards was referenced but none are kept in the trucks or actively distributed. Thus, crews report that "word of mouth" construction standards are applied. A lack of current construction standards leads to inconsistent installation practices that could lead to extra time needed to construct and to maintain infrastructure. This may also lead to a variance of materials being used from crew to crew for the same job. There are also related safety concerns if clearances, grounding, and proper insulation is unknowingly compromised. We recommend updated construction standards be developed or obtained and then

	distributed and communicated to all employees. A routine inspection practice needs to be established to make sure facilities are built to defined standards as well.
Define T&D Inventory Procedures	There are undocumented processes for equipment, tools, materials and vehicle support. We recommend reviewing how equipment is specified, tools ordered, gloves tested, booms tested, transformers tagged, etc. Dover should evaluate general T&D "operational" duties and the effectiveness of how they are handled and executed. It should identify these duties and tasks, who is responsible for execution, and whether they are being completed in an effective and structured way. Systems implementation would help with tracking these duties, but the processes for these duties must be documented and followed to effectively use any such system.
Cable Tagging Process Should Be Reviewed	Staff stated that cable tags are handwritten in the field and are then transferred to maps. Tagging should be reflected on the maps in an accurate and visual way so that the tags can be used for switching and asset tracking. Dover should verify that device numbers are being placed on the maps correctly so field personnel can locate and operate the power system in a safe and expedient way.
APPA Reporting Process Should be Reviewed	Emphasis on APPA's Reliable Public Power Provider (RP^3) program appears to be causing a reporting bias. The objective for maintaining these metrics should be communicated, and workers should be trained to ensure that underreporting is not happening. We recommend reviewing information reported to APPA to ensure data accuracy and to make sure it is not compromised to achieve certification. Development of standardized definitions of reliability is needed. As better tracking systems are implemented at Dover, reliability tracking is expected to become easier to monitor.
Review Truck Replacement and Maintenance Processes and Procedures	Dover may wish to review its truck replacement and maintenance policies and procedures. Currently, trucks are replaced every 12 to 13 years. Dover has limited in-house major maintenance repair capability and it is hard to get quick turnarounds when work needs to be done because city mechanics are busy with other duties. We recommend a review of the condition of the existing fleet and to look at whether doing minor maintenance is cost effective. Outsourcing of all vehicle/equipment maintenance work could be considered if fleet downtime is becoming an issue or adding additional costs.

Review Tree Trimming Program	The City of Dover needs to better understand tree caused outages and the tree trimming schedule in place. Dover has two tree trimming crews today. Compiling better information on tree-related outages can help determine if the current staffing and trim cycle is sufficient. Also, there is a need to review process issues with chips and disposal. An effective chip "give-away" program could be established to reduce landfill disposal costs.
Systems	
Ensure Critical Inventory On-Hand for Abnormal Circumstances	The current formula used for the prescriptive reset of inventory levels does not allow for enough on-hand material needs if abnormal conditions occur. For example, the recent snow storms experienced by Dover depleted many standard stock items such as dead-end shoes and pin-type insulators. These items have not been properly accounted for during inventory reorders and are occasionally on back order. We recommend a review of the cycle usage formula that drives the reorder points and that Dover apply different reorder criteria based on the type of material. Low usage items that are unique (especially for out-of-production items that Dover still has in-service) or items needed only during emergencies need to be considered differently than regularly used inventory items. "Weighting" the formula for unique and out-of-production items and for crucial emergency stock levels is one way to accomplish this. Also, we recommend that Dover include a provision in the usage formula to account for erratic usage patterns that seldom occur such as major events (i.e. bad ice storms, hurricanes, etc.).
Institute Regular Line Maintenance Schedules	Regular, systematic line patrols need to be done to avoid preventable maintenance failures, which can be a safety issue and cause unnecessary outages. Line patrols are not being done on any schedule today, which means only happen-chance observed maintenance is occurring. A monthly patrol should be incorporated into the system so that it produces the documentation needed to generate maintenance work orders as line inspections come due.
Review Light Installation and Replacement Schedules	We recommend a review of the vapor light replacement and maintenance process, as the Trouble Truck currently spends a high percentage of time on lights. An economic analysis on the upfront and ongoing costs associated with installing and maintaining street and private lights is recommended. Based on the result of the analysis, Dover may wish to make changes to the lights provided for different situations (i.e. LED vs. Vapor) and incorporate this analysis into installation and replacement schedules accordingly.

Training and Development	
Linemen Need to Maintain Training	Utility operations needs to identify an individual from the region that can come help demonstrate contemporary and advanced lineman skills. The type of skills needing emphasis should be determined as well as the frequency of training.
Review if Merchant Training is Sufficient	Merchant versus Co-op training in Virginia was implied as an issue because the Merchant training is not as extensive as what is provided in the Co-op training. Dover should determine if the Merchant training is extensive enough and whether supplemental training is needed. Additionally, refresher training is needed to ensure work skills and practices do not diminish, potentially leading to a variance in work production and possible safety issues.
Staffing	
Linemen Are Well Rounded and Diversified	Dover's current complement of linemen are well-rounded and diversified in abilities. This is desirable, especially considering the small size of the line crew staff. We recommend that Dover continue to reinforce the practice of on-the-job cross-training where all linemen participate in the full range of regular work to develop the skills of more junior linemen.
Promotion Path for Linemen Should be Reviewed and Total Compensation Should Be Communicated	The biggest challenge with lineman staffing is to ensure that turnover rates are low. One of the most common reasons cited for turnover was linemen leaving because of low pay and/or no progression until senior linemen leave. Dover has recently benchmarked its pay rates against other regional utilities. It would be beneficial to communicate the total compensation package value to employees, ensuring that they understand that Dover's compensation includes benefits that often exceed other local utility opportunities. Dover should also recognize that certain benefits may be more attractive to employees closer to retirement compared to employees just beginning their career. Also, the vacancy/progression situation is abnormal in regard to becoming and being paid as a 1st class journeyman. Most other utilities only have a single classification and pay rate for a journeyman. Dover should perform a relative comparison of regional pay rates for different trade classifications at comparable regional utilities.
Review Outsourcing of Electrician Work	Electrician work is currently outsourced to DeVary Electric. Dover should review the Master Electrician "professional services" contract to ensure that the scope of work covers the necessary installation and maintenance work required. How the work is released and authorized should also be reviewed.

Communication

Review Communication Between T&D and System Ops for Customer Calls	Because System Ops receives incoming calls from customers and T&D responds, clear communication processes should be in place to follow-up on completed work. Implementing new systems would help with this process and allow System Ops to track requested work more easily.
More Communication about Generation Side of Utility	Dover linemen voiced that they do not have a strong understanding of the generation side of the business. While it is not necessary for every employee to have a complete understanding of all aspects of utility operations, we believe that providing regular forums for management to communicate updates to employees and for employees to ask questions and provide feedback to management can be useful. Having the forums be regularly scheduled (such as quarterly) allows employees to come prepared with questions and/or comments, as opposed to having to think on the spot if communication opportunities are unscheduled.

3.3 Engineering

This section contains recommendations for the Engineering department. Below is a departmental summary followed by detailed recommendations within each key focus area.

Engineering Department Time is Valuable	The use of Engineering Department time should be reviewed to ensure that engineers are spending their time appropriately. Today, it seems the selected engineers are spending a disproportionate amount of their time on the ERP system. This is creating a situation where much of the electrical work is done on an "urgent" basis rather than following planned work schedules.
Engineering Does Not Have Respect within Electric Department	The value of the engineering department should be made clear throughout the electric utility. There have been situations we have observed that make it clear that other departments do not see the value the engineers provide. Having better communication of the work done by engineering and a better tracking system should help alleviate this concern.
Engineering Needs a Leader with Technical Knowledge	Currently, the engineering department is lacking leadership both within engineering and at the electric director level. The engineers need a leader who understands engineering and who can follow-through on ensuring that engineering work is completed to standards.
Dover Should Evaluate In-House vs. Contracted Engineering Work	Dover currently relies on outsourcing for certain electric department projects. Depending on the goals of Dover going forward, there may be opportunities to outsource additional engineering projects to manage staff size needs, or to bring certain projects currently outsourced back in house to develop engineering staff skillsets. Having better processes identified and tracking systems would help Dover better understand the workload of the department.
Standardized Process & Procedures	
Standardize on the Use of Mapping Software for the Future	Dover currently uses two different GIS/mapping systems, AutoCad and ESRI. It is cumbersome and inefficient to have two different systems-of-record, and it causes duplication of work to ensure that both systems are kept up-to-date. Furthermore, Dover needs to assess its future mapping needs and how they may interact with the new ERP and potential CMMS systems in mind. There are some inherent and preferential advantages to each system, but ultimately it would be advantageous to have a single system-of-record to maintain which interfaces with other systems.

Street Light Inventory Discrepancy	The inventory of street lights served by Dover is not consistent across the GIS, HTE, and Energy Analysis spreadsheet. Inventory needs to be reconciled and a system-of-record should be established. The mapping needs to be accurate and synchronized with the operating platform. It should be determined how lighting usage is estimated and accounted for so that the quantity of lights and their consumption can be reconciled.
Process for Marking Open Tie Points Between Feeders	Today, engineering keeps a spreadsheet for Normal Open tie points between feeders. This spreadsheet should be reviewed for accuracy and to ensure the switch and tie points on the spreadsheet are shown on a map that Operations can use in the field. The load flow information at the tie points should be available in tandem with the map. This information should be kept and verified at the System Operations center. We recommend tracking this process in a more standardized place such as in the mapping system. Once the process is defined, it should be communicated across the electric department.
Review Prioritization of Engineer's Work	Engineers report that operational "fires" make up 40 to 50% of the average day. Having better work tracking systems in place would help to resolve this by prioritizing the urgent tasks and creating a clear schedule of upcoming work tasks. Attention to time management and ensuring tasks are completed with the OHIO principle of "only handle it once" may help engineers feel more in control over their schedules as well.
Develop Formal Substation Maintenance Program	A more formal program should be considered to perform routine inspections and tests as well as preventative maintenance on substations. No asset management plan exists today for substations besides a recently-created spreadsheet report. In the short term, this spreadsheet should be reviewed to ensure that time-sensitive routine work is being accomplished. Longer-term, a system should be used for substation maintenance tracking. The ERP system has a Public Maintenance Management area that may meet this need.
Systems	
Review Cyber Security Policy	Cybersecurity is crucially important for electric utilities. Staff have a concern that the current approach to cybersecurity and password management may not be sufficient, and is sometimes ignored. Dover should contemplate a review of its cybersecurity and establish a password management protocol that is followed by all electric department users.

Determine if Cellular Access Would be Beneficial	Engineering staff would like to have cellular internet access in the field for laptops. This would be used for internet data access and for substation tech support. Dover should consider a review of the costs, benefits, and security considerations of remote devices and network access.
Review Need for Smart Phones for Improved Communication	Additionally, engineering staff feel that smartphones would lead to greater efficiencies than the current flip phones. Smartphones would allow engineers to access email and data both in the office and in the field. The justification for smartphones could be reviewed with a cost/benefit analysis and address any potential cybersecurity concerns.

Training and Development

Technical Support Contributions by Engineering Department	Field staff have a perception of a lack of technical expertise and support provided by the engineering department. A lack of technical leadership and mentoring may be contributing to this, but a lack of training investment and non-market competitive salaries may also be factors. We recommend that Dover hire an Electric Director or engineering manager that has a depth of knowledge in engineering and operations so that he or she can support and mentor technical staff. This leadership, along with training initiatives, would help less experienced engineering staff build their knowledge base and confidence.

Staffing

Review Adequacy of Staffing	The two engineers spend most of their time on substation projects. Engineering performs regular substation work while Pike Electric performs the major maintenance, installations and commissioning of substations. While it seems substation work should make up a good portion of staff engineers' time, Dover may wish to review the importance, turnaround time, and priority of the work tasks completed by the engineering staff. This assessment would assure the engineers' skill sets and abilities are being fully utilized. Depending on the outcome of this review, Dover should consider whether the amount of outsourced engineering is appropriate.
Review Fiber Optic O&M Contract	Fiber optic O&M is completed through a contract with KCI Comm Infrastructure. Dover should review this contract and ensure it is satisfying its current requirements. In the review, Dover should address how best to provide for future capacity and connection requirements as fiber is installed, replaced and repaired.

Communication

Ensure Departments are Communicating Effectively with Engineering	There have been reports of incidents occurring where a lack of respect was shown to engineering staff. The next Electric Director should be aware of these issues and institute an open communication culture in which departments can express their concerns so that better communication channels can be implemented.

3.4 System Operations

This section contains recommendations for the System Operations department. Below is a departmental summary followed by detailed recommendations within each key focus area.

System Operations Requires Specialized Technical Knowledge	System Operations requires a technical understanding of work completed by electric utility staff. Leadership with this skillset helps to ensure that work orders are taking the appropriate amount of time and give staff confidence that leadership understands the work that needs to be completed.
Better Phone Systems Would Improve Workflow	Implementing a more advanced phone system with an interactive voice response (IVR) system would help Dover better manage customer calls and prioritize their work load to ensure the most critical issues are resolved quickly.

Standardized Process & Procedures

Review Accuracy of Overall Interruption Data	Dover should review the accuracy of reported information in the eReliability Tracker Annual Report. Currently, Dover's APPA major event threshold is 14.9674 minutes. Dover's SAIDI & SAIFI numbers are abnormally low as well. This should be investigated further to verify that interruption information is being properly captured and reported.
Define Outage and Review Reliability Tracking	Dover should review its reliability definitions and ensure that they are being measured correctly. Based on APPA reports, Dover's outage performance appears to be significantly better than other relative utilities. Adequate thresholds should be reviewed for momentary, duration, and frequency interruption data. Additionally, we recommend that Dover standardize the process for conducting cause analysis on all interruptions. It is important to communicate the rationale behind changes to reliability measurements so that employees understand that better reliability measurement and cause analysis would help Dover in the long-run yet, in the short-term, would likely negatively impact the reported reliability statistics.
Review FERC PRC Compliance Requirements	Dover should verify that any FERC PRC matters that are still in scope and applicable are being followed. As Dover is aware, NERC and ReliabilityFirst reliability standards are updated regularly, and Dover should have a process to ensure that it remains in compliance with standards as they evolve.

Validate Proper Switching Order Process	Dover should review its switching order execution and whether proper documentation and communication is taking place in regard to abnormal conditions. There should be a formal process to handle "abnormals" to make sure that field personnel are fully aware of any abnormal system configurations, inoperable equipment, or damaged facilities. Abnormal conditions should be verified in 3-way communication and/or updated documents.
Optimize Use of EMS System	An operating handbook with requirements and objectives should be provided to the System Operators to ensure that the Siemens EMS system is being fully utilized. This would ensure that the power system is being monitored diligently and that the EMS functionality is being maximized. Dover should review what the EMS monitors, how information is being shared, and how information is benefiting Operations. It should also be determined if there are underutilized EMS capabilities that could benefit Dover.
Standardize Formal Close out of Customer Requests	HTE service requests are sent directly to Ops with no formal close-out or documentation that ties back to the customer. There should be better feedback processes in place to ensure that historical records can be located and referenced. While the new ERP system should resolve this issue, we recommend a review to ensure that the ERP system would provide the written records and work close-out process needed.
Systems	
Dover Needs an IVR System	Without an interactive voice response (IVR) system, Dover does not have the ability to record overflow calls. The ability and need to have a record of all calls is critical for customer service and safety reasons. Dover should strongly consider adding an IVR system to ensure that calls are being properly tracked and completed. This is also a vital tool to assist with outage situations. Ideally, an IVR should tie into the future operating platform and assist with order execution.
Improve Outage Management Tracking System	The trouble crew reports that there is little assessment of an outage situation before they are dispatched for service. Because Dover does not have an outage management system (OMS) or interactive voice response (IVR) system, there is little way to know the severity of an outage quickly. At a minimum, Dover needs to aggregate calls to have some predictive assessment capability. We recommend that Dover purchase and implement an OMS with an integrated IVR system so they can monitor

	outages more closely, dispatch crews more intelligently, and report outage situations more accurately.
Review System One Line Adequacy	The current system one-line is adequate for general purpose but there should be status indicators for alerts and abnormal conditions. We recommend that Dover review EMS settings for alert conditions and how abnormal conditions are tagged.
Review Display of SCADA	The current SCADA monitoring process relies on multiple display screens. This can be challenging for operators to manage compared to a single SCADA display board. Dover should ensure that alerts are triggered to notify the Operator of abnormal conditions or out-of-range readings so that no reading errors are missed by the operator.
Training and Development	
Review PJM Training to Determine if it is Sufficient	Today, System Operations relies heavily on on-the-job training with occasional off-site training sessions. Dover should ensure PJM training is sufficient and kept current and validate whether regular bulk electric system (transmission)-type training is occurring.
Staffing	
Review Adequacy of Staffing	System Operations is currently staffed by five individuals working 12-hour shifts plus the lead who works 8 am – 5 pm on weekdays. Dover should review this staffing mix to determine what range of duties are completed by staff during each shift. An IVR system may help to alleviate the burden of the call center during abnormal situations. Dover should also track customer feedback after dealing with the call center through automated surveys.
Communication	
Review Communications Between System Operations and Other Departments	Dover should ensure that System Operations is able to communicate effectively with other departments, especially relating to outages and service issues. Implementing a CMMS, as discussed above, would help System Operations track issues through to resolution more easily.

3.5 Metering

This section contains recommendations for the Metering department. Below is a departmental summary followed by detailed recommendations within each key focus area.

Metering Responsibilities are Split Between Customer Service and Electric Utility	Responsibility for metering and the maintenance of metering systems is split between Dover's electric department and customer service department. The analysis in this section examines all aspects of the metering systems, with the understanding that some of the observations and recommendations may be more applicable to the customer service department than the electric department.
Dover Should Review Metering Hardware Capabilities and Limitations	Dover's metering hardware does not allow for remote metering. The metering department must obtain data by making regular rounds throughout customer neighborhoods to pull data from each meter. More advanced meter functions are available and Dover should review the costs and benefits of upgrading its metering hardware.
New Customer Processes Should be Reviewed	Dover should review the process and costs for new customer connections. The cost of extending service to a new customer should be determined and justified on a case by case basis.

Standardized Process & Procedures

Review Process and Charges for New Customer Addition	New customers pay the cost of materials for service extensions today. There are no additional estimated costs related to the extension of service. Dover should conduct an economic analysis to determine if this practice is justified. If changes are required, new connection policies and procedures should be updated and communicated to customers ahead of the change.
Review Same Day Reconnect	Dover's same-day reconnect policy currently prompts dispatch in real-time whenever an online payment is received, 24 hours a day, 7 days a week. This is not standard process within the industry. Dover should review whether same-day reconnect is prudent, especially when payment is made after business hours.
Review Reconnect Fee Basis	Customers requesting reconnection of electric service are currently charged $100. Dover should review the actual costs incurred during a customer reconnect, especially for same-day reconnects, and determine if the $100 charge is justifiable. Dover should also clearly communicate what the cost covers to customers during reconnection.

Ensure Meter Reading and Revenue Collection Data is Accurate	Dover should implement proactive measures to validate accurate revenue collection. This includes flagging and investigating suspect meter reads and possible diversion situations.
Implement Best Practices for 3-Phase Totalizing Meters	Dover is currently using 26 GE 3-phase totalizing meters. Dover should ensure that standardized policies and procedures are in place related to these meters. We recommend that Dover review the current process and history of service to determine whether any changes are needed.
Review Process of Collection of Startup Fees by Field Staff	Field meter staff are currently able to collect connection fees via check or money order directly from customers during setup 24 hours a day. There are many concerns related to safety and security of field techs handling customer payment. We recommend reviewing the benefits of this policy compared to the associated risks.
Systems	
No Ability to Remotely View SCADA Data	Dover does not currently have the ability or process to remotely view SCADA data. Additional follow-up is needed to determine if the Siemens system has this capability or if it is a domain "turf" issue within the City of Dover. Dover should have the capability to receive SCADA information remotely and should implement remote access or electronic information sharing.
Conduct Cost Benefit Analysis on Current Meter System	Dover relies on Itron's drive by meter reading system. This drive by system only provides the meter reading function and limits what data can be automatically provided. Dover should review if this system is still meeting its needs or whether more advanced metering infrastructure should be rolled out.
Review System for Tracking Metering Work Orders	Metering work orders should be generated and tracked to ensure that all tasks are completed. Currently, metering work orders are tracked manually in Excel spreadsheets and it is unclear whether this tracking system is sufficient or efficient. It should be determined if a better solution exists, and metering work orders should be included into the ERP platform when it is deployed.

Staffing

Confirm Duties Between Metering and Customer Service	There are currently three meter readers in Customer Service plus one supervisor. As Dover gains better insight into work completed by staff, further analysis should be conducted to ensure staffing levels are appropriate for the metering department.

3.6 Generation

This section contains recommendations for the Generation department. Below is a departmental summary followed by detailed recommendations within each key focus area.

Dover is Currently Assessing Generation Ownership	As discussed in the Generation memo recently prepared by Avant, there are decisions to be made related to Dover's continued ownership of generation assets. The current economics of generation ownership may not be in the best interest of the City of Dover. Our recommendations in this section are related to the on-going operation of generation until this decision is finalized.
Dover Needs to Monitor NAES Contract	The current NAES contract is not favorable to the City of Dover. The management fee and monthly true-up practice is excessive for the services provided. The current NAES contract expires on June 30, 2020. It should be noted that a typo in the "definitions" section of the contract incorrectly states May 30, 2020. Per the contract the City of Dover must notify NAES by December 29, 2019 if it would not be extending the contract. If the City of Dover plans to continue operation of either McKee Run or Van Sant Stations, long-term plans should be drafted in late 2018 for execution in 2019. Several options for continued operation are available including a competitive bid for other operating companies, absorbing the operations into the Electric Department, or renegotiating the NAES contract.
Ensure Staffing Levels Align with Plant Needs	Review of the NAES O&M contract found that the O&M costs were in line with expectations. However, savings can be achieved by decreasing staffing from 26 to 20 personnel. Including salaries and burden, it is estimated that eliminating six positions would decrease operating costs by approximately $420,000 annually. The operations staff could be reduced to lower operating costs and increase staff utilization. The current staffing plan uses 4 shifts with 3 personnel on a shift. Three personnel are not necessary except for peak load periods when both plants are running simultaneously. With the addition of the remote start capability at Van Sant, the need for an extra operator is further diminished. In addition, the current practice of sending operators to Van Sant every shift is excessive, especially considering the upgraded camera system being proposed.

Dover should evaluate removing four operators from the plant staff. Each shift would have 2 operators and could utilize an on-call system during peak load periods or if required for day-ahead starts.

Having a business manager and an administrative assistant is redundant and not common for plants of this size. Dover should evaluate eliminating the administrative assistant position and adding those duties to the business manager.

In a facility of this size, materials control is usually a collateral duty of a maintenance team member. With the size of the maintenance team, these duties should be easily absorbed by the maintenance supervisor or a senior mechanic. Dover should evaluate eliminating the materials coordinator position.

Standardized Process & Procedures

Review Capital Planning Process and Reviews

The process for budgeting and tracking Capital Improvement Projects could be altered slightly to increase the granularity in the process and ensure that funds are being spent as projected. For projects that involve inspections and potential part refurbishment or replacement, the inspections should be allocated as a separate line item from the repair. This practice would allow for better planning of future costs and prevent the desire to carryover unused funds from the prior year. All costs for capital investments are levelized for the year. Dover should evaluate this practice and determine if it would be advantageous to allocate funds to the anticipated expenditure months.

Dover should consider not approving the CIP to install a Fast Start upgrade at McKee 3. There is no analysis in the plan detailing the savings provided by the system. It should be evaluated to ensure the return on investment is favorable to Dover based on the number of starts per year for the unit.

Ensure Environmental Processes and Roles are Understood

Increased focus should be placed on environmental compliance for the generating stations. The current structure for environmental compliance is not well communicated and enforced. NAES is required to maintain O&M manuals specifically regarding environmental compliance procedures and to supply all data and information required to maintain all environmental permits. This requirement includes preparing reports and the oversight of facility compliance with environmental permits. The City of Dover is responsible for signing all environmental correspondence with regulatory bodies. The new director should put a

	compliance plan in place that incorporates regularly scheduled environmental program reviews with the NAES Plant Manager.
Review Large Equipment Inventory Capital Planning	The Capital Improvement Plan for Large Equipment Inventory should be reviewed to ensure the benefits of storing these components outweigh their large costs. Most generation facilities stock smaller repair parts that are found to be the most likely components to fail.
Ensure Critical Component Inventory is Sufficient	NAES should create a critical component list that details parts that are difficult to procure and can cause long outages. These items should be considered for stock or find an outlet where they can be obtained in <24 hours.
Training and Development	
Create Annual Approval Process for NAES Training	NAES should have an annual training schedule approved at the same time as the annual budget. The City of Dover would approve the schedule and validate that the agreed upon training is being completed. This would ensure that NAES is being efficient with its training time and receiving what it needs. Operations training is required because of the limited start up and shutdown capabilities. The training should be tailored to ensure that no issues occur because of poor training that affect plant availability.
Communication	
Dover Needs to Ensure all Third Parties Understand Roles	There is noticeable tension between NAES and TEA. Based on field observations and interviews, it can be surmised that NAES wants the plants to operate more often. NAES questions the processes and procedures for plant dispatch. We reviewed the plant dispatch and generation communications from TEA to the City of Dover and found them to be adequate. The City of Dover should act to educate plant staff on the dispatch methodology. NAES does not fully understand the economics of what drives plant dispatch. They do not need to receive all the information, but need more background to understand what TEA is doing. The training includes roles and responsibilities of all parties involved. Following the training, the city should engage in regular meetings with the plant manager and his director regarding dispatch results. We do not believe that NAES should become more involved in dispatch decisions.

3.7 Indirect Service Centers

This section contains recommendations related to the Electric Department's interaction with the City of Dover's Indirect Service Centers.

Multiple City Departments Interface with Electric Department

In addition to our in-depth review of the City of Dover's electric department, we also conducted discussions with the leaders of five city departments that interface indirectly with the electric department. These departments were:

- Customer Service
- Procurement
- Finance
- Information Technology (IT)
- Human Resources (HR)

Several common themes that were identified are summarized below, followed by a more detailed discussion of each department's relationship to the electric utility.

Common Theme: Other Departments Miss the Leadership of an Electric Director

A common theme that was echoed by each department head interviewed was that they miss the leadership of an electric director at the head of the electric department. While some of the comments related to the specific individual previously in the electric director role, there were also multiple comments on the difficulty of not having a "go-to" leadership peer with whom to discuss issues and challenges.

Common Theme: Leveraging Technology to Enhance Employee and Customer Experiences

Another issue identified by multiple departments was the desire to incorporate technology to enhance both employee and customer experiences at the electric utility. Specific examples offered included the use of tablets on electric department trucks to manage work orders and/or inventory, the rollout of advanced metering infrastructure (AMI), and a more advanced phone system for managing customer calls during system outages and storms.

Customer Service and Procurement Work Most Closely with Electric Department

Of the five departments identified above, the customer service and procurement departments work most closely with the electric department. These areas are analyzed in more depth than the remaining three functional areas.

Customer Service Reads Most Meters

Dover's customer service department is responsible for reading the meters of nearly all of the city's customers. The electric department directly reads the meters for roughly ten of the city's largest electric customers.

One issue that was identified related to metering is that Dover's current ITRON radio meter reading system is not scheduled to be supported after 2021. The city is exploring alternatives to this system as part of the ERP implementation currently underway.

Customer Service Processes Payments and Handles Collections

The customer service department also processes all customer payments and is responsible for collections efforts related to past due accounts. The cashiers that collect customer payments are located at Weyandt Hall and responsible for all other cash collections in the city, in addition to electric account payments.

New Electric Service Requests Are Coordinated Between Customer Service and Electric Department

Requests for new electric service in the City of Dover are coordinated between the customer service department and the electric department. New customers typically contact the customer service department, which in turn creates a work order for the new customer setup in the HTE system. The electric department then installs the necessary equipment to provide electric service to the new customer.

Customer Service Does Not Handle Outage Calls

The customer service department does not typically receive or process calls related to electric system outages – these calls usually go directly to the electric department. A more robust system for processing outage calls could help Dover's electric department provide better customer experiences during outages, when customers frustration level is already high.

Procurement Department Manages Most Electric Procurement

The procurement department manages most of the procurement for Dover's electric department. It is responsible for annual bidding of standard stock items as well as spot buying when inventory needs are identified during a weekly review process. Procurement is also responsible for managing the new stock request process and running all bidding processes.

The electric department is allowed to directly purchase materials and services if the total value is under $25,000 and three quotes are received.

Procurement Actively Managing Inventory Issues

The procurement department is actively managing some of the issues related to the relatively high level of inventory within the electric department. More discussion of inventory levels compared to other utilities can be found in Section 5.

Dover has evaluated its inventory by reviewing items that have not been used in 99 months. Unless a specific need is identified for retaining an item, old inventory is being liquidated. This process is planned to be repeated for items that have not been used in 60 months.

In addition, the procurement department is now requiring the electric department to use existing inventory when a specific stock item is updated to a new vendor or part. Previously, the new part was ordered and old inventory was left unused. This new process should help reduce the amount of unused and obsolete inventory moving forward.

Some Electric Department Items Are Used Infrequently but Are Critical When Needed

While we support Dover in its efforts to rationalize its electric department inventory, we also caution the city to be careful in liquidating items that have not been used for a long time. In the electric utility industry, many inventory items often have a long useful life but are critical to have on hand when the old item fails. Often, these critical items have longer than average lead times to procure.

Potential Control Issue Around Requisitions

One potential internal control issue was identified related to the procurement process. Typically, the same person entering the request for a stock item into the system also approves the request. A better control process would be to separate the requisition and approval of inventory stock items.

Other than this issue, the procurement department appears to have well-defined processes and procedures around inventory ordering and receiving.

Inventory Allocation Process May Be Reducing Turnover Rate

The inventory allocation process, particularly related to larger capital projects, may be reducing Dover's inventory turnover rate. When a new capital project is approved and entered into the system, the current date is usually entered as the project start date, even if the actual anticipated start date is months in the future. By entering the current date as the project start date, the system immediately shows the need for inventory items related to the project. This often causes inventory to be ordered well in advance of when it is actually needed.

It is unclear whether this practice is the result of conservatism to ensure that inventory is available when needed or because users are entering the current date as an expediency. Dover should experiment with entering anticipated project start dates to better manage turnover.

This change could be incorporated into a broader improvement in the process and planning around capital projects, as discussed in prior sections.

Standard Procurement Contract Language Has Existed for Many Years

The standard procurement contract language used by Dover's electric department has existed in its current form, unchanged, for many years.

A thorough review of the form contract, from both a business and a legal standpoint, would improve the clarity around issues such as liability. Implementing changes to language around liability may be difficult, as contractors for services such as boring may be unwilling to take on risks that they have not historically borne.

Finance and IT Departments Focused on ERP Rollout

Both Dover's finance and IT departments are heavily focused on the ERP rollout. The electric utility department component of the ERP implementation is scheduled for Phase IV – approximately two to three years from now.

Finance and Electric Department Interactions Are Limited

The interactions between Dover's finance department and electric department are limited. The primary communications between the departments relate to requests for information by the electric department regarding the budget status of capital projects. With the hiring of a budget analyst within the city manager's office, the finance department's role in budgeting for the electric department is limited to non-operating items such as interest expense and interest income. The finance department also works with the electric department to prepare certain regulatory reports such as the EIA-861 form.

IT and Electric Department Interactions Are Limited

The interactions between Dover's IT department and electric department are also limited. IT maintains the phone system and computer network of the city, including at the electric department. It also provides technical support and guidance regarding Dover's SCADA system, which is maintained by the electric department. The IT department is also playing a key role in the planning and implementation of the new ERP system.

HR Department is Overwhelmed with Day-to-Day Tasks and Urgent Requests

The Human Resources department has limited staff resources. Core HR functions, such as payroll and staffing, are performed at the most basic level to meet requirements. Given the lack of HR resource availability, important services and programs that would assist the organization are often delayed or not performed at all. Other HR tasks are prioritized by urgency and requirements such as safety, employee complaints, or union contract deadlines. Given the limitations of the HR group, outside firms are often called upon to assist with matters that could be handled by a typical HR group.

The HR resources are in a constant "reaction" mode to address these most urgent needs which ultimately has a cost impact because other HR initiatives are not performed. Other impacts to the utility include:

- Longer time required to fill vacant roles
- Staff turnover because of lack of development for succession
- More safety issues and errors because of lack of training

HR Personnel are Unable to Dedicate Time to HR Initiatives That Impact the Organization

There is little capacity today for HR to provide services and support beyond a basic level. There are many areas we have identified that need attention from HR staff including:

- Improved employee onboarding
- New training programs
- Employee development and succession planning
- Leadership coaching and development
- Performance management
- HR processes and protocols
- Updated employee manuals and resource documents
- Staffing and hiring reviews

Consider Outsourcing Some HR Functions or Bringing in Temporary Employees

Outside resources should be considered more strategically as to how they can best support the HR function. Dover may consider outsourcing some of the core HR functions such as payroll and benefits administration. This is common at utilities the size of Dover, and many vendors can be sourced through a RFP process. Another option would be for Dover to bring in an HR temporary contractor or intern that could help complete some of the HR initiatives listed above that would greatly impact the effectiveness of the workforce and the organization.

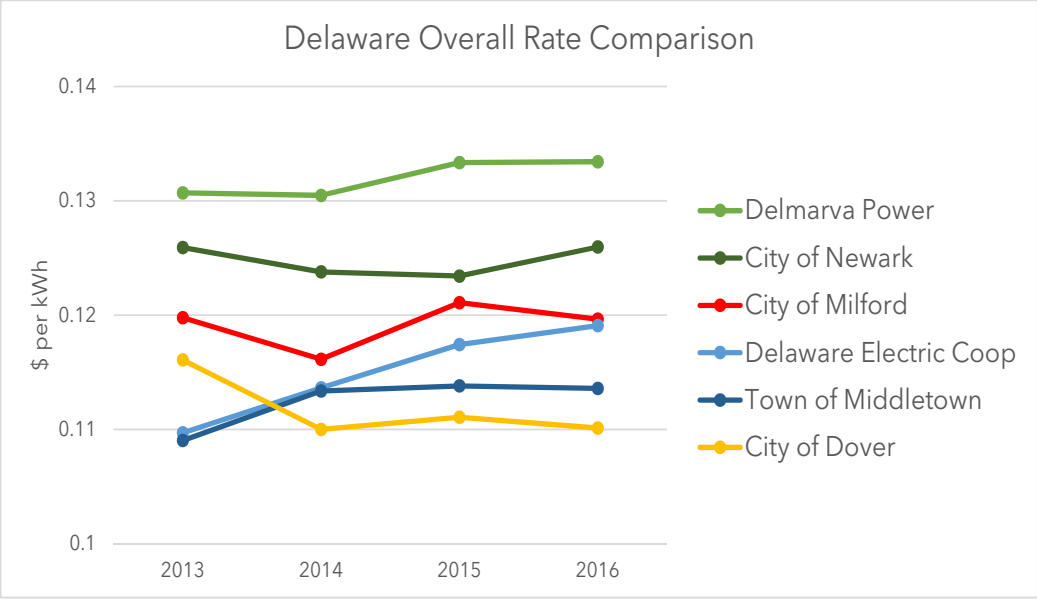
Finally, we recommend providing additional outside HR training for the existing HR staff so staff can learn current practices and additional resources available to them. While the current HR staff does not have the capacity to do these things, we believe improving the HR function at Dover would have a direct impact to the businesses productivity, quality, and efficiency.

Section 4. Electric Utility Financial Reporting and Benchmarking

This section discusses key financial metrics for Dover's electric utility, including comparisons with competitors and peers.

Dover Electric Rates are Some of the Lowest in Delaware

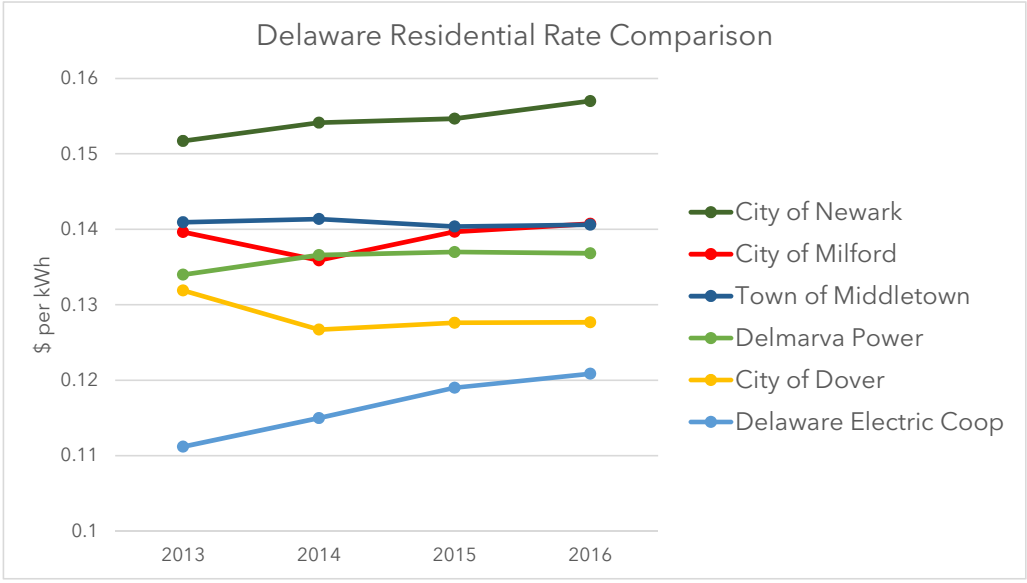
Overall, Dover's total average electric rate to customers has been among the lowest in the state of Delaware over the past four years for which data is available, as shown in the graph below:



All rate data presented in this section is taken from utilities' form 861 filed with the United States Energy Information Administration (EIA).

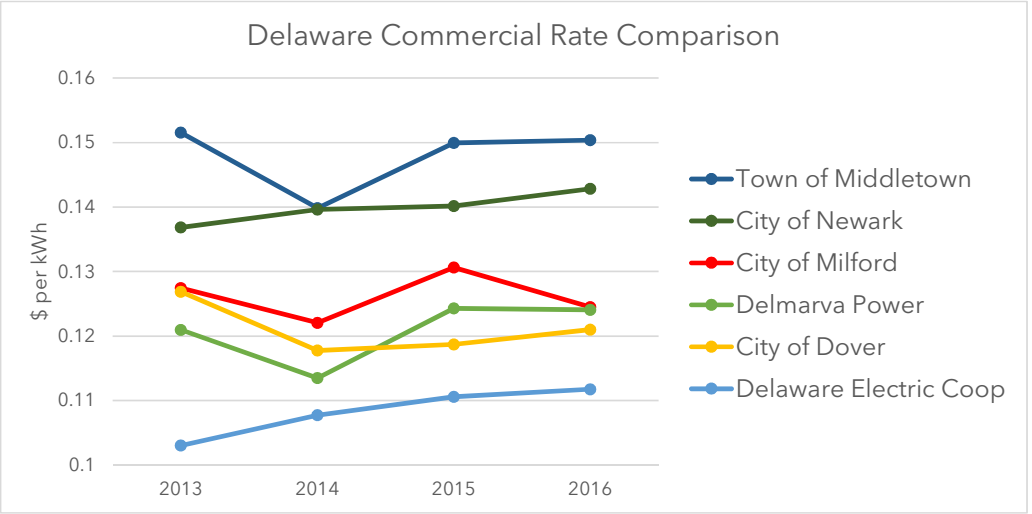
Only DEC Has Lower Residential Rates than Dover

Delaware Electric Cooperative (DEC) has had lower residential rates than Dover over the past four years; however, the two utilities' residential rates have remained relatively stable, even decreasing slightly, while DEC's residential rates increased during each of the four years shown.

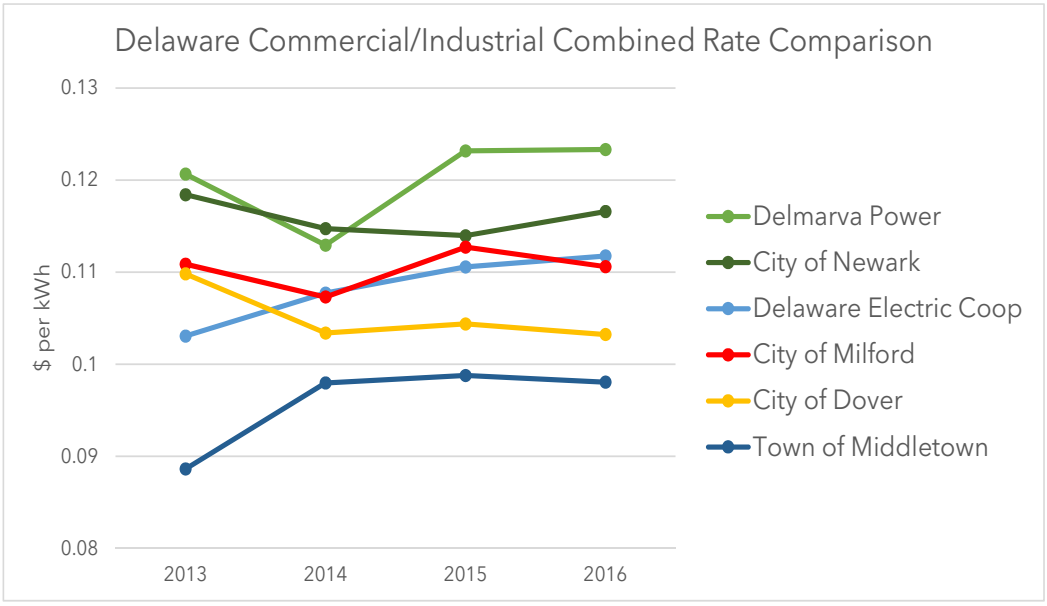


DEC Commercial Rates Appear Low Because DEC has No Industrial Rate Class

Dover's commercial rates appear to be somewhat higher than those of DEC when comparing commercial rates, as shown in the graph below:



However, DEC only has a large commercial customer rate class – it does not have an industrial rate class. When commercial and industrial sales are analyzed together, the average rate for Dover is lower than that of DEC, as shown in the graph below:



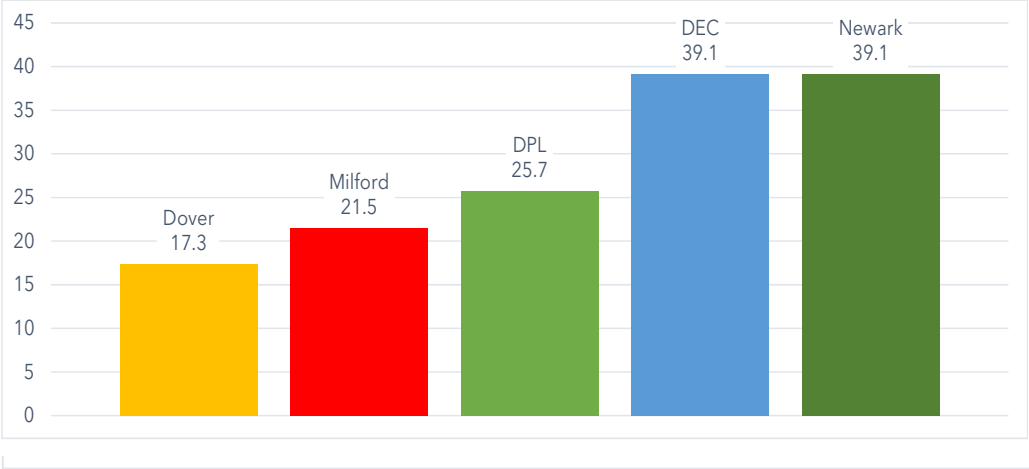
Dover Is Making Its Industrial Rates More Competitive

Further analysis of Dover's relative rates and rate structure is not included in this report, as the City has recently completed a cost of service study. This report recommended three phases of rate adjustments to be implemented on July 1 of 2018, 2020, and 2022. In summary, the recommended adjustments result in increases for residential and small general service rate classes and decreases for most other rate classes. For rate classes with decreases, both energy and demand rates are proposed to be decreased, with small increases to customer rates.

Dover's Ratio of Revenue to Inventory Is Significantly Lower Than Competitors

We analyzed Dover's level of electric utility inventory compared to other peers and competitors in Delaware.

The graph below shows inventory turnover (defined as electric sales revenue divided by average inventory) for Dover, two other Delaware municipal utilities, DPL, and DEC for the most recent available fiscal year. For this metric, a lower number represents a greater level of inventory



Dover has the lowest inventory turnover of the peer group analyzed, with a turnover level that is less than twice that of both DEC and the City of Newark. In other words, Dover's level of inventory relative to revenue is higher than the other peers analyzed in this report. The next section presents some recommendations related to inventory management.

Dover Has Strong Reserve Account Balances

Dover's electric utility has a number of reserve accounts, including:

- Depreciation Reserve Account
- Future Capacity Account
- Insurance Stabilization Account
- Rate Stabilization Account
- Contingency Reserve Account

Each of these accounts has a targeted minimum or required balance range. For all five of these accounts, the actual balance at the end of fiscal year 2017 met or exceeded the target balance.

The funding levels of these reserve accounts should help protect Dover if an unexpected event were to occur by providing additional liquidity and flexibility. They should also help Dover build new or replace existing capacity within its electric system.

Dover has been able to provide a Power Cost Adjustment credit to its electric customers over the past few years because of its strong rate stabilization account balance that has exceeded targeted levels.

Section 5. Alternative Organizational Constructs

This section provides an overview of alternative organizational constructs for Dover.

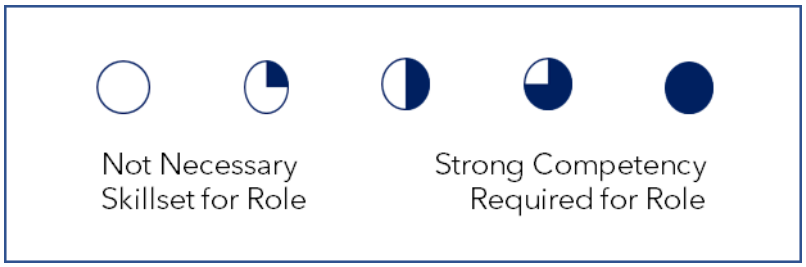
Organizational Assumptions

Dover Expected to Manage Generation At Least Until 2022	Based on the decision to participate in the PJM capacity markets, Dover is expected to operate its owned generation until at least 2022. Our alternative organizational constructs include the need for the Electric Utility to continue to oversee generation. If Dover decides to sell its generation, the alternative structures should be reviewed to determine if they are still applicable.
Dover Is in the Process of Hiring a New Electric Director	All of our recommended organizational constructs assume that a new Electric Director is hired in the near-term. Each alternative has a slightly different set of desired qualifications for the Electric Director role, as discussed in detail below.

Summary of Alternatives

Four Alternatives are Presented	We have developed four possible alternative organizational structures for the Dover Electric Utility that are explained further within this section. The four alternatives presented are ranked in recommended order: Alternative 1) Group Engineering and T&D Alternative 2) Separate Divisions Alternative 3) Group Engineering and System Ops Alternative 4) Minimize Staffing
Personnel Needs are Compared Across Alternatives	Across leadership roles, we compare positions based on capabilities in four key areas: - **Business** – Utility business operations knowledge - **Engineer** – Understanding of electrical engineering - **People** – People management capabilities - **Generation** – Knowledge of utility-scale generation

We have classified the capabilities needed for positions using the following scale:



Hire Electric Director with Deep Utility Business Knowledge, People Skills, and Some Technical Skillset

The two key competencies necessary for an Electric Director are utility executive business and people management experience. Ideally, the individual would have some technical engineering and generation familiarity as well, but an individual with strong skills in all four areas may be difficult to find and would likely require a higher salary than is currently envisioned for the role.

The table below shows the capabilities desired for an Electric Director across the four alternatives we present:

Electric Director Capability Comparison				
Desired Competencies	Business	Engineer	People	Generation
Alternative 1	●	◔	●	◔
Alternative 2	●	◕	●	◔
Alternative 3	●	◔	●	◔
Alternative 4	●	◕	●	◕

Hire Experienced Engineer with Generation Experience

The individual hired to oversee Engineering needs to have significant electrical engineering experience, and would ideally have familiarity with utility-scale generation as well. Strong people skills are desirable given the supervisory nature of the role.

The table below shows the capabilities desired for the individual overseeing the engineering department across the four alternatives described above:

Engineering Oversight Capability Comparison				
Desired Competencies	Business	Engineer	People	Generation
Alternative 1				
Alternative 2				
Alternative 3				
Alternative 4	N/A	N/A	N/A	N/A

The individual required for Alternative 3 would assume the current Electric Engineering & System Operations Supervisor role and would thus require deeper business knowledge than if just overseeing engineering. Alternative 4 represents the outsourced model and would not require hiring for this role.

Maintain a Dedicated Lead for the T&D Team

A dedicated lead for the T&D team is recommended. This role is necessary to handle day-to-day line crew supervision as well as managing any union-related issues. This structure also provides the electric director a single point of contact to get updates on T&D.

Consider Separating Engineering from System Operations

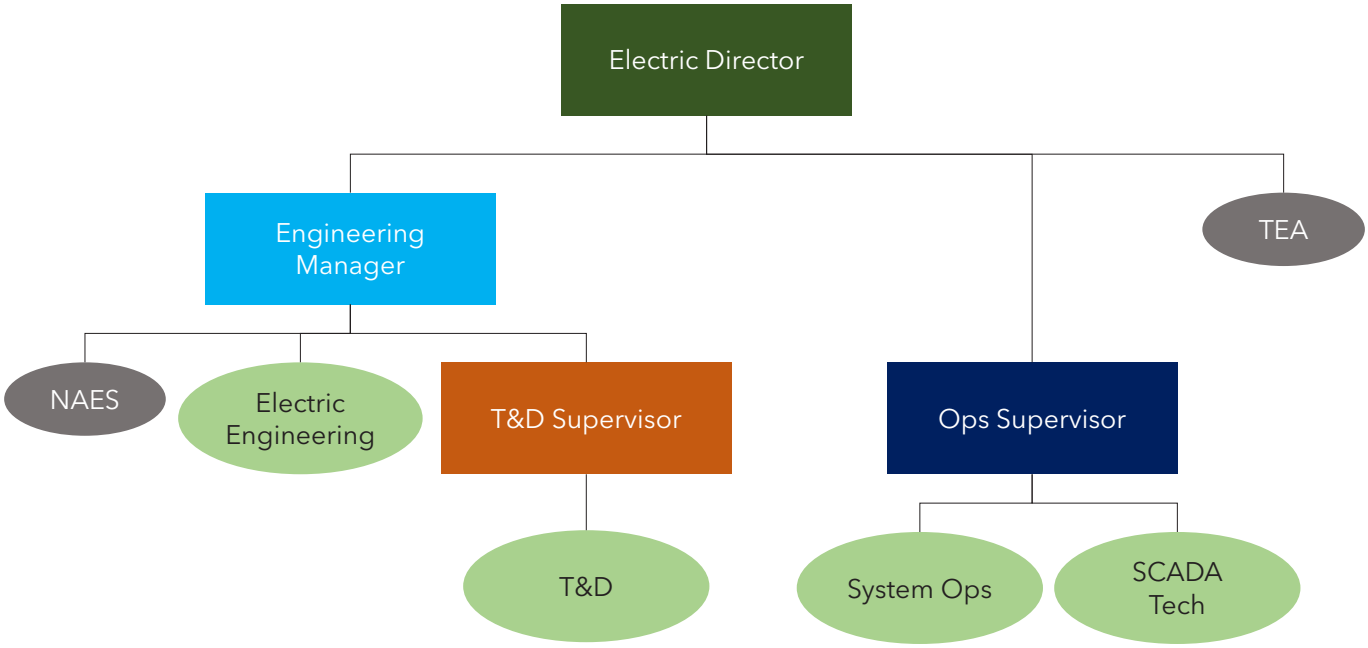
In all but one of our alternatives, we contemplate moving engineering and System Operations under different departmental leads. The tasks and duties of these two departments are typically not aligned and take a significant amount of time to coordinate and plan. Having two separate managers overseeing these two departments may be preferred. In Alternative 3, the manager overseeing both engineering and System Operations is envisioned to be near-electric director level and qualified in this role to manage both departments.

Institutional Knowledge Should Not Be Lost in Transition

There is significant institutional knowledge in existing Dover Electric Utility staff that should not be lost during an organizational restructuring. While the exact roles and duties of existing staff may change to some degree, we do not recommend outright downsizing of staff.

Separate Oversight of NAES from Oversight of TEA	Oversight of TEA and NAES should be considered as separate tasks. We recommend that the Electric Director oversee TEA in all of our proposed organizational structures. It would preferable that NAES be managed separately from TEA so as to maintain a clear separation of responsibilities. We only recommend the Electric Director maintaining oversight of both TEA and NAES in Alternative 4.
Consider Using a 3rd Party Consultant to Review NAES and TEA Contracts	A third party would bring an unbiased perspective to the operations of both NAES and TEA. While we do not recommend outright outsourcing of contract management, it may be beneficial to have a third party assist with contracting to ensure a fair agreement between parties.
More Engineering Outsourcing Could be Considered	Regardless of which alternative is selected, Dover Electric Utility may choose to rely more on contract engineers for short-term, intensive projects. This would reduce the strain on existing Engineering staff and would allow for time to set up the Engineering department for success with the recommended changes in this report. Alternative 4 envisions the highest degree of engineering outsourcing - all other alternatives should consider engineering outsourcing on a task-by-task basis.
Develop Communication Plan Related to Any Organization Changes	Dover needs to communicate *why* changes are happening to the organization and what the impact of changes would be on all staff within the utility before communicating *what* the change is. Make city leaders available for staff to ask questions and to address any concerns about the reorganization. Once there is an understanding of why the change is occurring, only then should the department move forward with any restructuring.
Ultimate Decision on Organization Structure Depends on New Electric Director	The organizational construct best suited for Dover Electric Utility depends heavily on the skillset of the individual chosen to fill the Electric Director role. Based on that individual's skills and managerial preference, he or she should be able to determine which organizational construct is best for the Dover Electric Utility.

Alternative 1) Group Engineering and T&D



Alternative 1 Requires Hiring Three New Staff

Under Alternative 1, Dover would need to identify staff to fill three new roles:

- Electric Director
- Engineering Manager
- T&D Supervisor

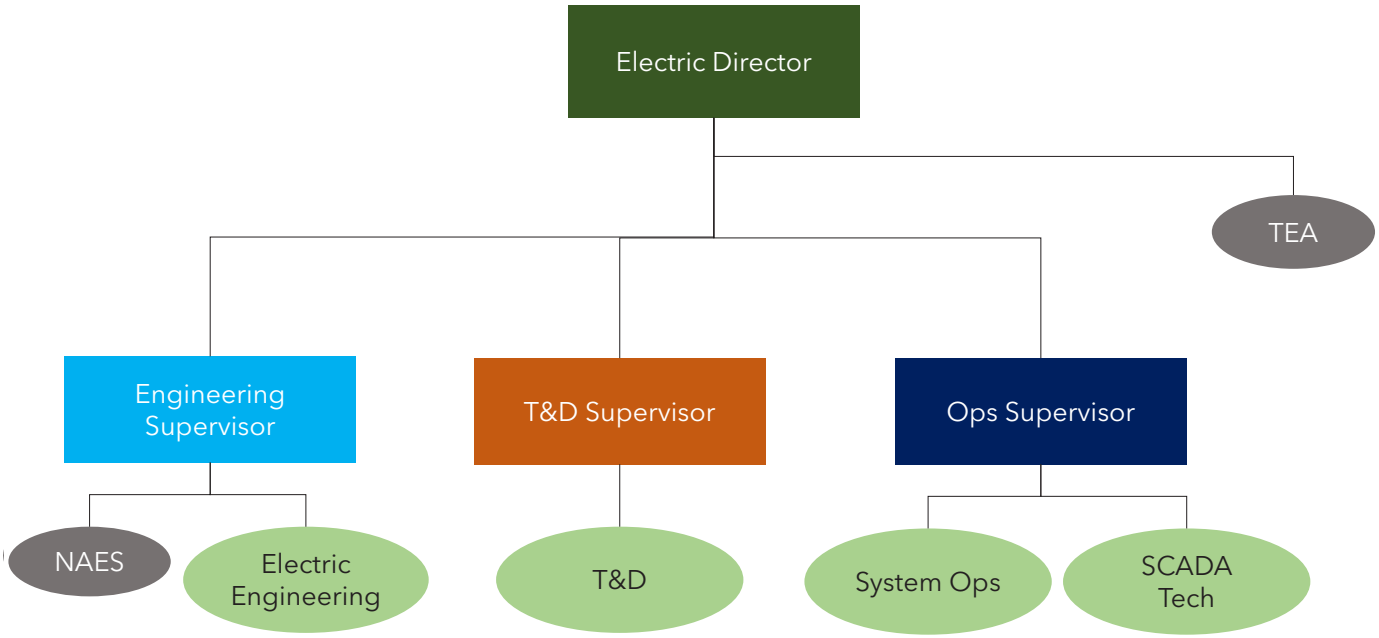
Role Capability Requirements for Alternative 1

The table below shows the desired competencies of individuals selected to fill the given roles under this alternative:

Desired Competencies	Business	Engineer	People	Generation
Electric Director	●	◔	●	◔
T&D Supervisor	◔	◔	◑	○
Ops Supervisor	◑	◑	◕	○
Engineering Manager	◑	●	●	◕

Alternative 1 Improves Coordination Between Engineering and T&D	Because Engineering and T&D require close coordination to complete system projects, this alternative is preferred since both departments would be under the same Engineering Manager. This would also ensure that the two groups communicate effectively between one another.
Reduces Need to Hire an Electric Director with Deep Technical Knowledge	In this alternative, the Electric Director is not required to have as deep of knowledge in Engineering and Generation, and can be more targeted toward an experienced utility business executive. We believe this skillset aligns better with Dover's proposed Electric Director salary. Having additional managerial support at the engineering level is likely to be more sustainable for the Electric Director to manage long-term as well.
Places Engineering and Generation Responsibilities with Engineering Manager to be Hired	The Engineering Manager position would be ideal for an experienced engineer who can both mentor existing Engineering staff and talk knowledgably about generation with NAES. While finding a candidate with generation experience would be ideal, we believe there are many senior engineers with the skillset to manage Dover's generation oversight. NAES is also likely to respond better to managerial oversight from someone with some degree of generation knowledge.
Requires Hiring of T&D Supervisor	A T&D Supervisor would need to be hired under the Engineering Manager. This role would replace the position previously held by Billy.
Ops Supervisor Role Maintains Existing Operations Duties	The main change to the Ops Supervisor role would be the removal of oversight of Engineering. This change allows the Ops Supervisor to focus more heavily on the day-to-day operations of the utility and less on the technical operations.

Alternative 2) Separate Divisions



Alternative 2 Requires Hiring Three New Staff

Under Alternative 2, Dover would need to identify staff to fill three new roles:

- Electric Director
- Engineering Supervisor
- T&D Supervisor

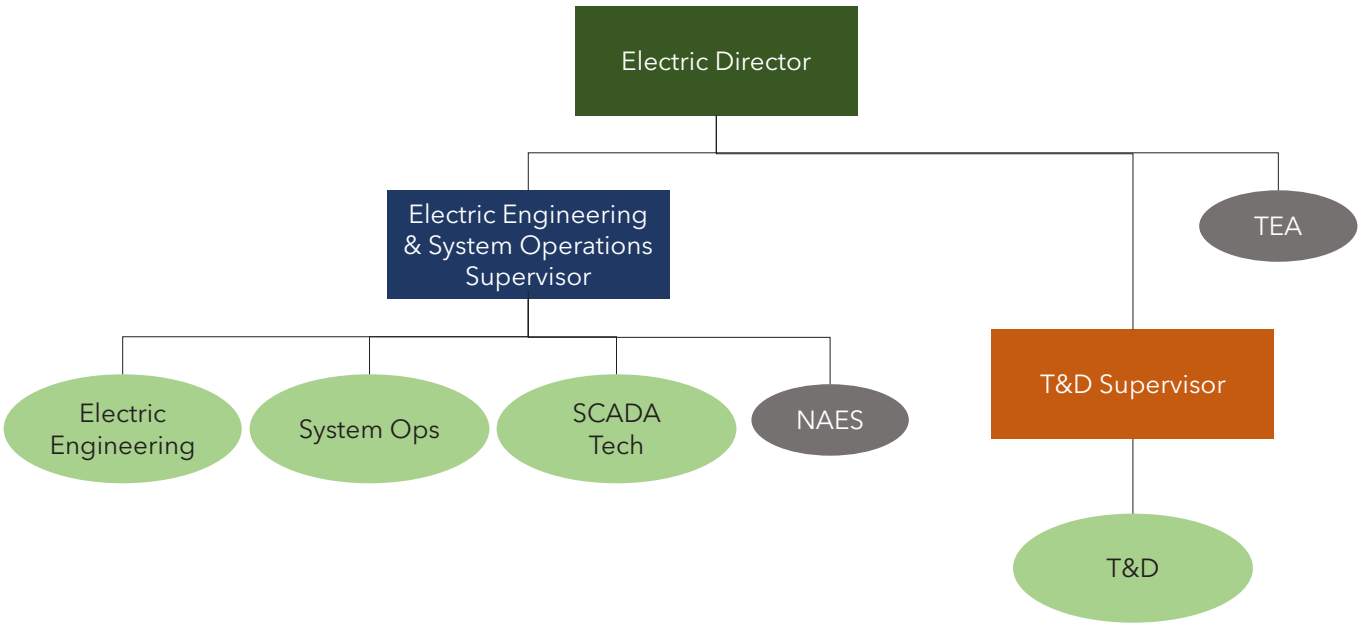
Role Capability Requirements for Alternative 2

The table below shows the desired competencies of individuals selected to fill the given roles under this alternative:

Desired Competencies	Business	Engineer	People	Generation
Electric Director	●	◕	●	◔
T&D Supervisor	◔	◔	◑	○
Ops Supervisor	◑	◑	◕	○
Engineering Supervisor	◔	●	◕	◕

Alternative 2 Creates Flat Structure Across Departments	Under this alternative, the Engineering Supervisor, T&D Supervisor, and Ops supervisor are all on a similar level within the Dover Electric Utility. The Electric Director would be required to oversee each department and ensure coordination is occurring between all three.
Requires Hiring Electric Director with More Technical Capabilities	This alternative envisions hiring an Electric Director with more technical knowledge so that he or she can speak to the specific details handled by each division. Also, because this alternative puts the Electric Director as the direct manager of all three department supervisors, the individual should have the skillset to manage conflicts as they arise between departments.
Engineering Role Would Be a Supervisor, Not a Manager	As described above, this alternative structure would be more hierarchically flat across the organization. We envision the individual hired for the engineering oversight role would be at a supervisor level rather than a manager. Hiring for this less experienced managerial skillset would likely help reduce the salary necessary for this position.
Managing NAES Would Be Responsibility of New Engineering Supervisor	The Engineering Supervisor would be responsible for NAES in addition to the engineering department. We believe that finding an individual with the necessary skillset to manage generation would be more likely for this role. NAES responsibility could be moved under the Electric Director if the right person was hired, but we believe finding such a candidate may require a higher salary than currently proposed by Dover.
Requires Hiring of T&D Supervisor	A T&D Supervisor would need to be hired under the Electric Director. This role would replace the position previously held by Billy.
Ops Supervisor Role Maintains Existing Operations Duties	The main change to the Ops Supervisor role would be the removal of oversight of Engineering. This change allows the Ops Supervisor to focus more heavily on the less technical operations of the utility.

Alternative 3) Group Engineering and System Ops



Alternative 3 Requires Hiring Two New Staff

Under Alternative 3, Dover would need to identify staff to fill two new roles:

- Electric Director
- Engineering & System Operations Supervisor OR T&D Supervisor

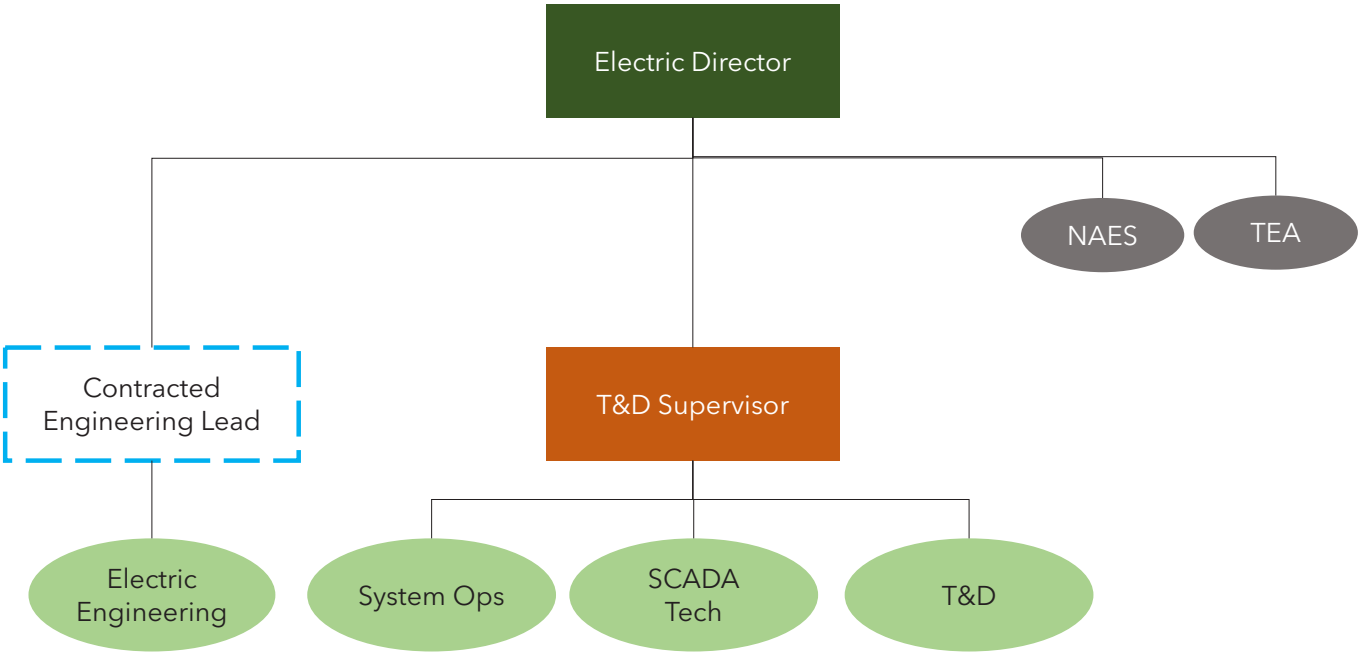
Role Capability Requirements for Alternative 3

The table below shows the desired competencies of individuals selected to fill the given roles under this alternative:

Desired Competencies	Business	Engineer	People	Generation
Electric Director	●	◔	●	◔
T&D Supervisor	◔	◔	◑	○
Electric Engineering & System Ops Supervisor	◔	●	●	◔

Alternative 3 is Most Similar to How Dover Electric Utility was Previously Operating	This alternative represents the most similar structure to how the Dover Electric Utility was organized prior to the departure of the Electric Director and the retirement of Billy as the T&D Supervisor.
Puts Responsibility on the Engineering & System Operations Supervisor	In Alternative 3, the role of the Electric Engineering & System Operations Supervisor is given many responsibilities over day-to-day electric utility duties. This role would be managing Engineering, System Operations, and NAES. This role would require a very skilled and experienced engineer to be most successful. The individual would also need to have very high people management skills because of the number of departments overseen.
Electric Director Would Rely Heavily on Input from Engineering & System Operations Supervisor	Because of the heavy set of responsibilities put on the Electric Engineering & System Operations Supervisor role in Alternative 3, the Electric Director would be seen more as an interface between the City and the Electric Utility. This would reduce the amount of technical experience that this individual would need to have. One risk of this approach is that the Electric Engineering & System Operations Supervisor and the Electric Director may demand very similar salaries in order to hire qualified people.
Require Hiring T&D Supervisor and/or Replacing Engineering & System Operations Supervisor	Under this scenario, one person would need to be hired for either the Electric Engineering & System Operations Supervisor role or for the T&D Supervisor role. The T&D Supervisor would replace the position previously held by Billy. It is possible that existing Dover staff could be realigned to fill one of these roles.

Alternative 4) Minimize Staffing



Alternative 4 Requires Hiring One New Staff Plus an Engineering Contract

Under Alternative 4, Dover would need to identify staff to fill one new role:

- Electric Director

Additionally, Dover would need to identify and contract with a qualified Engineering firm under Alternative 4.

Role Capability Requirements for Alternative 4

The table below shows the desired competencies of individuals selected to fill the given roles under this alternative:

Desired Competencies	Business	Engineer	People	Generation
Electric Director	●	◕	●	◕
T&D Supervisor	◑	◑	◕	○
Ops Supervisor	N/A	N/A	N/A	N/A
Contracted Engineer	○	●	◔	○

Alternative 4 Represents the Lightest Staffing Approach	Alternative 4 presents the organization structure requiring the fewest amount of Dover Electric Utility staff. The number of individuals required to staff Alternative 4 is similar to the current interim staffing situation at Dover Electric Utility today.
Requires an Experienced Electrical Director Hire	Under Alternative 4, the Electrical Director requires significant utility business and technical skills. We believe that it may be challenging for Dover to find all the skills in one person at the targeted salary level.
One Supervisor Role Required to Oversee T&D and System Ops	There would be one role under the Electric Director to manage all of the Dover Electric Utility staff in T&D and System Operations. This is similar to how the Electric Engineering & System Operations Supervisor is serving today, except with no engineering oversight.
Engineering Management Would Be Outsourced	Dover's staff engineers would be responsible for handling the day-to-day engineering department duties as they do today. An outside engineering firm would be contracted for oversight of projects and to coach the current engineering staff. The benefit of this is that it reduces the number of full-time staff Dover needs to hire, but the risk is that engineering staff leave and Dover relies entirely on a contracted engineer. Furthermore, a contracted engineering lead is likely to be less focused on employee development than a supervisor who is a Dover employee.
Existing Engineering Staff Could Be Developed into Engineering Supervisor Role	As opposed to hiring an outside Senior Engineer as presented in other alternatives, this alternative maintains a similar structure as to how the engineering department operates today without a direct engineering manager. It would be envisioned that one of the existing staff may be developed to fill a more senior in-house role over time.
Presents Risk to Long-Term Viability of Electric Utility	Because of the significant importance of the Electric Director in this role, Dover could face a similar situation as it does today when the next Electric Director leaves. Attrition at the T&D Supervisor level or the engineer staff level could also lead to a significant loss of institutional knowledge.

Section 6. Recommendations for Implementation

This section provides a summary of recommendations from the benchmarking report.

Hire New Electric Utility Director	The City of Dover should place the highest priority on hiring an Electric Utility Director. This position is crucial to the implementation of many of the recommendations in the report. It is important that the new Electric Director understands the long-term vision for the electric department and is able to implement change effectively.
Determine Electric Department Structure	Before hiring any additional staff beyond the Electric Director, the utility should decide which organizational structure best fits its long-term objectives.
Hire Additional Electric Department Roles	Additional personnel should be hired to fill the chosen organizational structure. Selection criteria should be developed for each position based on the needs of the organization.
Implement Standard Processes and Procedures	Process and procedure improvement recommendations are detailed throughout this report. These improvements should be planned and implemented to improve operational efficiencies and ensure clear communication of standards.
Establish A Training Program	A more structured leader and employee training program should be developed and implemented. This program should include both technical and soft skill training. It is recommended that an outside consultant be used to create the training and development programs to ensure success. Training that would improve the overall productivity of staff should be proposed by the individual disciplines and managed by the Electric Director.
Utilize Systems to Better Manage People and Resources	The electric department should make better use of systems to manage people and resources. The implementation of a CMMS program as discussed in Section 3, would allow the leadership team to develop an understanding of the department's needs for efficient operation in terms of both staffing levels and inventory usage.

Improve Communication Channels Between City Leadership and Electric Department Staff	A more formal method of face to face communication between department leaders and employees should be created. Host open "town hall" style forums with the city manager so that electric staff understand what is happening at various levels in the organization. This provides the necessary mechanism for employees to voice concerns and suggestions.
Institute More Rigorous Oversight Over NAES	Oversight of the generation facility and its operator (NAES) should be improved. The roles and responsibilities of contractors involved in the daily operation and dispatch of the units should be clearly defined and regularly reinforced. A rigorous review of the plant operating contracts should be conducted in late 2018 or early 2019 before beginning any negotiation for contract extensions.
Dover Should Develop a Timeline for Implementation of Recommended Changes	Developing a timeline would help the Dover Electric Utility to set milestones and track progress throughout the implementation. A high-level visual timeline should be shared with the entire organization to communicate and show commitment toward the improvement process while a more detailed version can be maintained for utility leadership's use. Having individual department goals and deadlines would keep the entire organization on track as all departments work through detailed recommendations.

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