Project Number and Title	Additional Information	Project Description	Project Justification
Communications - Rate Period (Jan. - Sept. 2019)			
159568: 19 Remote Term Unit Upgrades	Project Type: Communications In-Service Month: 9 In-Service Year: 2019 Primary Purpose: Reliability Secondary Purpose: N/A Priority: Required Total Project Spending: $125,133	The purpose of this project is to improve communications and control functionality at several locations on the Company's transmission system. This work is focused on replacing the remote terminal units (RTUs) at North St. Albans, Manchester Transmission, and Middlebury Lower Hydro Stations. These RTUs are 1980s vintage, analog, electronic technology that is no longer supported by the vendor and for which spare parts are not available. This work will also further the decommissioning of RTUs that presently communicate with a legacy master SCADA front end processor (FEP) located at the Company's Systems Operations Headquarters. The FEP is a server of the same vintage as the RTUs and is also no longer supported. This project will require installation of three (3) RTUs and cabinets at the locations noted above.	This project is appropriate at this time to address significant reliability concerns associated with multiple remote terminal units (RTU) that are more than 30 years old. This project is part of GMP's five-year-plan for an orderly replacement of these devices, the loss of which (or of the SCADA FEP) could result in the loss of SCADA control/communications to as many as twenty facilities. The FEPs cannot be replaced until all RTUs have been upgraded.
Computer Hardware - Interim Period (Oct. 2017 - Dec. 2018)			
148493: 2017 ISO NE RTU	Project Type: Computer Hardware In-Service Month: 10 In-Service Year: 2017 Primary Purpose: Operational Efficiency Secondary Purpose: Reliability Priority: Required Total Project Spending: $122,279	This project consists of the installation, configuration, connection, testing and production deployment of software RTUs (remote terminal units) used to establish direct connection of the ISO New England and GMP SCADA systems. This provides a direct connection of telemetry values fed from generating stations on our SCADA system between GMP and ISO-NE that is required for GMP to participate in ISO markets for dispatch of generating assets based on market demand. GMP became the Designated Entity at ISO-NE for all GMP's generation assets in order to continue participation in ISO markets, as VELCO had notified GMP they would no longer be providing this function. As a result, GMP put a system in place to perform this role in order to continue participation in ISO Energy Markets related to the dispatch of generating assets based on market demand. The project also paves the way to our participation in potential future frequency regulation markets as distributed generation opportunities grow.	It was critical that GMP continued their participation in ISO New England markets and now that VELCO no longer provides that service for GMP given the growing size and market complexity, we needed to establish the ability to perform that function internally. Ultimately the transition to becoming our own designated entity with ISO made sense given the number of generating units we have, the efficiencies in having directly automated contact with ISO and establishing our own connection for the participation in future frequency regulation markets.
148494: 2017 IT Blanket	Project Type: Computer Hardware In-Service Month: 10 In-Service Year: 2017 Primary Purpose: Operational Efficiency Secondary Purpose: N/A Priority: Required Total Project Spending: $293,794	This project is the IT "blanket" and consists of purchases for small incidental, miscellaneous projects that we have every year due to failures, additional equipment and software needs and emergency replacements. The IT Blanket is intended to cover these purchases and the amount is based on a historical 5 year average of actuals.	The IT Blanket is appropriate as it provides GMP the flexibility to approve smaller, incidental and emergency capital requests for items that are expected throughout the year.
148511: 2017 Plant Networking	Project Type: Computer Hardware In-Service Month: 11 In-Service Year: 2017 Primary Purpose: Operational Efficiency Secondary Purpose: N/A Priority: Required Total Project Spending: $82,603	GMP maintains network connectivity to many of our generating plants. This project replaced the network switches in various plants. The switch models in those locations were end of life with the vendor. End of life with the vendor means they no longer support the device, or provide product updates, bug fixes or security vulnerability patches. This puts GMP at risk of security breaches at the network layer. The current switches also did not support PowerOverEthernet (PoE). PoE functionality is required for use of our existing Avaya Telephone Voice Over IP phone technology as well as wireless networking infrastructure. This switch upgrade will enable us to deploy other GMP standard technologies to these sites. PowerOverEthernet capable Cisco network switch stacks with redundant power were installed at various locations and the old switches were retired.	As noted above, the existing switch models were end of life which put GMP at risk of security breaches at the network layer. The new switches added needed functionality. With the growth of the Avaya Telephone System and Aruba wireless technologies, this switch upgrade was required to continue deployment of those technologies to these sites.
148512: 2017 Plant Wireless Network	Project Type: Computer Hardware In-Service Month: 11 In-Service Year: 2017 Primary Purpose: Operational Efficiency Secondary Purpose: N/A Priority: Required Total Project Spending: $37,589	In addition to network connectivity to most of our generating plants, GMP has implemented wireless connectivity in the plants as well and this project continues prior efforts to expand wireless networking at our facilities. GMP has deployed iPads and iPhones as standard devices for voice and data communication tools for all field personnel including Power Production/Plant workers, in order to improve efficiency, communications, and safety. Effective use of these devices at remote locations requires they have the ability to communicate with enterprise systems within GMP's datacenters. They can do this via the cellular network, however, data plans with cellar carriers are costly. Installing an enterprise wireless system at these locations enables the users to transfer data to/from corporate and the internet at no incremental cost per Gb and the performance will be better than over cellular. This project included installation of wireless access points consistent with the rest of the enterprise at 11 Plant locations. Location (# of Access Points): Essex(3), West Danville(1), Bolton(1), Little River/Waterbury(1), Moretown/Middlesex(1), Berlin(2), Marshfield(1), Gorge 16(1), Gorge 18(1), Searsburg(1), Vergennes 9(1), Vergennes 9B(1).	In the past couple of years, GMP has deployed company issued iPhones and iPads to all field workers and we have deployed multiple enterprise applications via these tools, in order to improve efficiency, communications, and safety of off-site workers. It's critical that we now update the infrastructure at these sites to enable them to utilize these devices effectively just as they do when they are in a district facility.
152049: 2017 GATEKEEPER CONVERSION	Project Type: Computer Hardware In-Service Month: 11 In-Service Year: 2017 Primary Purpose: Operational Efficiency Secondary Purpose: N/A Priority: Required Total Project Spending: $397,228	This project completed the conversion of our smart meter (AMI) data collection devices, called gatekeepers, from an AT+T 2G wireless backhaul connection to a Vermont Telephone Co (VTEL) 4G LTE wireless backhaul connection. GMP has approximately 700 gatekeepers deployed throughout its territory that aggregate smart meter data and backhaul it to GMP's data center for processing. A key element of our US Dept of Energy (DOE) smart grid grant was our unique partnership with VTEL to backhaul smart grid communications securely on a public wireless network. The project integrated with VTEL's roll out of their statewide broadband technology. As VTEL completed the build out of its 4G LTE wireless network in 2015 and 2016 GMP followed behind the network commissioning locations to convert the gatekeeper communication modules over to being compatible with the VTEL network, as our DOE grant called for.	This project is necessary to improve the reliability and operational efficiency of the network that allows GMP to collect smart meter data. The migration of GMP's AMI gatekeepers to a 4G LTE network from older technologies such as dial-up and DSL will provide improved reliability, connection speeds and data quality, which is important because of the volume of data collected and transferred over this system. The project closely integrated with VTEL's roll out of their statewide broadband rollout. Upon VTEL's communication that an area was ready, we converted our communication devices (gatekeepers) from various methods (cellular, DSL, and dial-up) to VTEL's 4G LTE.

Project Number and Title	Additional Information	Project Description	Project Justification
153493: 2017 Firewall Hardware Rep	Project Type: Computer Hardware In-Service Month: 3 In-Service Year: 2018 Primary Purpose: Operational Efficiency Secondary Purpose: Safety Priority: Required Total Project Spending: $414,539	This project enables GMP to replace aging Checkpoint firewall appliances. This project is part of GMP's overall enterprise security infrastructure. Replacing the aging Checkpoint firewall hardware will provide many benefits. It will allow GMP to expand the amount of hard-drive space, as certain systems are running out of space. It will introduce faster processors and more memory to alleviate bottlenecks on systems. It will standardize equipment across multiple firewalls minimizing support efforts. It will reduce the yearly O&M expense associated with owning Checkpoint hardware appliances. This project includes the purchase of 32 firewall appliances and the associated licenses to replace all existing firewalls currently in production.	GMP is committed to protecting customer data and reliability of the grid. This project helps to advance GMP's security posture by installing new hardware to improve the efficiency of the firewalls. Additionally, improving the firewall performance provides greater efficiency for operations and the corporate network by providing the required network resource faster and more efficiently.
153492: 2017 Enterprise Video Conf Sys	Project Type: Computer Hardware In-Service Month: 5 In-Service Year: 2018 Primary Purpose: Operational Efficiency Secondary Purpose: N/A Priority: Required Total Project Spending: $125,890	This project will bring high quality audio & video conferencing, as well as content collaboration to the two sites listed below, to ensure the most effective communications in meetings, work sessions, and one-on-one discussions. In addition, this project is necessary to retire the existing equipment that is near the end of its useful life. GMP sites and workforce are geographically dispersed within Vermont. Although travel is often required between sites as the work at hand dictates a physical presence at a particular location, there are many times when business meetings, conversations, and collaboration can be most efficient remotely, as long as the proper technology is in place to ensure collaboration and the highest level of productivity can be achieved. Significant enhancements have been made in video conferencing technology in recent years. This project includes replacement of video conferencing equipment that is greater than 5 years old. The current equipment does not meet the quality and feature standards of current video conferencing offerings. The new enterprise system will bring high quality video and audio technology to remote meeting participants, incorporate content collaboration so documents and media can be shared while in video calls and introduces mobile device video and audio conference capabilities. In addition, the new camera and microphone technology available will auto size the video image in the room to accommodate for the appropriate number of participates, cameras will shift to the active speaker and noise cancellation will ensure human voices are heard but other noises in the environment are blocked out. These new features will ensure that whether employees are holding remote meetings site-to-site or working from home for the day due to poor road conditions or illness, communications will be effective and productivity levels will remain high. This project will introduce the new technology to two conference rooms, one in Rutland and one in Colchester. For this project, two Enterprise Video Conferencing Systems will be installed at GMP corporate sites. Video Conferencing Systems include the core processors, eagle eye cameras, microphones, Ultra HD 4k screens and software to centrally manage the systems. Two different configurations have been quoted based on the size of the rooms and features and functionality needed. The larger room requires a more sophisticated camera set and larger display. The smaller room can use a standard camera and a smaller display. Large Conference Room Setup including Group Series 500 Unit, Eagle Eye Director Camera, Peripherals and 82” Ultra HD 4k Display 1. Rutland Energy Innovation Center Classroom Small Conference Room Setup including Group Series 500 Unit, Eagle Eye Producer Camera, Peripherals and 55” Ultra HD 4k Display	The current video conferencing equipment is end of life and we are starting to see failures in cameras, microphones and processor units. The units are not easily repairable as parts are hard to find due to the age of the equipment. In addition, the quality of the units is poor making effective, clear and productive collaboration and meetings less successful. It's also an appropriate time as we have increased our use of video & audio conferencing significantly over the past few years as it's a fast, effective way to communicate with staff around the state.
153620: 2018 Cellular Amp Sys P&S	Project Type: Computer Hardware In-Service Month: 7 In-Service Year: 2018 Primary Purpose: Operational Efficiency Secondary Purpose: Safety Priority: Required Total Project Spending: $95,701	The 2018 Cellular Amplification System project for Plants and Substations is a second phase of work that was started in 2017. This is a continuation of a 2017 project (148474) in which we budgeted for and are currently executing the installation of these systems at 25 sites around the state. This 2018 project will implement these systems at an additional 25 sites. There are approximately 100 sites that will require this technology. Operations leadership will prioritize sites based on greatest need and areas of greatest safety concern to determine which 25 sites will be included in this next phase. Cellular amplification systems were scoped to be installed in 25 plants or substations. Due to some cost reductions in hardware, we were able to implement this technology at 30 sites within budget. The installed systems include two amplification nodes for AT&T and Verizon service boosting, as well as antenna equipment, cabling, installation, configuration and implementation service. Working with the managers of Substation Operations and Power Production, we prioritized sites based on greatest need and areas of safety concern. Each site was evaluated for qualification testing to ensure it meets minimum signal criteria. Qualifying sites then went through design, implementation tune and testing phases. This work was a combination of outside services labor and internal resources in IT.	Cellular technology has become a primary channel of communication for our field-based employees as well as a backup communication channel for traditional land lines in the event of a land-line system or voice circuit outage. Similar to the project we've done on the corporate side (district offices) of our operation, deployment of multi-carrier cellular amplification systems at various plants and substations will ensure cell users have sufficient coverage and signal strength to use cell phones as a primary communication tool. Cell phones are used for every day power switching orders, business communications, storm work as well as emergencies if needed. In addition to our own employees working regularly at these sites, it's common for contractors to work alongside us during regular business work as well as outage work. It is critical for workforce safety that individuals working at our sites and facilities have the ability to communicate and to call for help in the event of an emergency. GMP has a company-wide field safety improvement plan and these systems are a component of that overall plan. We are implementing these systems over several years until we have implemented the required primary and secondary communication methods in the field-based generation plants and substations that have been identified for these improvements. All GMP field personnel working in plants and substations carry a company issued cell phone. It is critical that these tools work for our users regardless of their location in the field, including in our substations and plants. Although we've seen growth in the cellular carrier coverage footprint in the state over the past few years, most of our plants and substations have seen only minimal signal improvements, still not capable of providing strong and reliable communications. The implementation of these systems allows us to work with a base level of carrier signal and maximize the effectiveness.

Project Number and Title	Additional Information	Project Description	Project Justification
153502: 2018 Server Upgrades	Project Type: Computer Hardware In-Service Month: 8 In-Service Year: 2018 Primary Purpose: Operational Efficiency Secondary Purpose: N/A Priority: Recommended Total Project Spending: $297,700	The project is part of a multi-year plan to replace end-of-life servers that are between 5 and 7 year old and evolve into a regular 3-4-year server infrastructure replacement schedule based on industry best practices. GMP has established a server infrastructure replacement schedule based on industry standards of 3-4 years. An established hardware replacement cycle ensures that enterprise applications are operating as efficiently as possible by taking advantage of the latest technology available in processors, memory, networking throughput and operating system technology, as well as reducing the risk of system failures. System failures have an operational impact on our users serving our customers in regular business interactions as well as storm restorations. Replacement of these servers will ensure the infrastructure responsible for server enterprise applications remains stable and reliable for our users. In addition, some of the hardware is out of warranty and due to its age, we are unable to extend warranty coverage. Equipment of this age is at a greater risk of hardware failure and without support from the vendor; parts and repair may be unavailable, causing extended or permanent system failure. This project will be used to purchase 15 new servers.	It is appropriate to continue to replace outdated technologies in order to keep technology up to date and reliable for our applications for day to day business functions as well as storm restoration. The servers replaced as part of this project are 5-7 years old. Some of the hardware is out of warranty and due to its age, we are unable to extend warranty coverage. Equipment of this age is at a greater risk of hardware failure and without support from the vendor; parts and repair may be unavailable, causing extended or permanent system failure. As noted above, we are working to replace older servers to get onto a 3-4 year replacement cycle, which meets industry standard. Replacing servers on a schedule will avoid large hardware purchases each year and continue to spread them out to each year having smaller purchases.
153504: 2018 Technolgy Refresh	Project Type: Computer Hardware In-Service Month: 8 In-Service Year: 2018 Primary Purpose: Operational Efficiency Secondary Purpose: Safety Priority: Required Total Project Spending: $279,515	This project will be used to purchase new end user technology to replace various technologies such as laptops, iPads, etc that are 3+ years old in the organization. Industry best practice on replacement of this type of technology is every 3-4 years. An established hardware replacement cycle ensures that technology is operating as efficiently as possible by taking advantage of the latest technology available in processors, memory, networking throughput and operating system technology. This ensures stability, through faster equipment as well as updating the operating system to a current and supported version. By not replacing older technology on a regular basis, it will lead to an increase in troubleshooting of old equipment and system failures that have an operational impact on our users serving our customers in regular business interactions as well as storm restorations. Overall, the reliability and stability of this aging equipment puts our systems and ability to serve our customers effectively at risk. Furthermore, newer operating systems are not supported on all older devices; leaving the devices and the company at risk for security vulnerabilities.	It is appropriate to continue with the established hardware replacement cycle to replace outdated technologies. This process keeps the technology operating as efficiently as possible with reduced risk of failures. Hardware stability and reliability ensures our employees can continue to serve our customers on a day to day basis as well as during storm restoration. Newer operating systems, applications and security patches are not supported on older systems and could leave us open to security vulnerabilities.
153491: 2018 MDM Stor & Compt Infra	Project Type: Computer Hardware In-Service Month: 9 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Customer Service Priority: Required Total Project Spending: $314,316	GMP's existing MDM storage environment presently consists of five servers - three for storage and two for computing. The first phase of the project was completed this past summer when we increased the storage capacity of our test environment (which was at capacity) by adding two additional storage servers with high capacity drives that increased the overall MDM storage capacity. The second phase of this project will increase the storage capacity of our production environment by adding one additional storage server with high capacity drives that will increase GMP's overall MDM storage capacity to 10-12 terabytes.	GMP maintains two significant storage environments. One for enterprise applications and another for MDM (Meter Data Management) data. This project will expand GMP's MDM storage infrastructure, used for managing data accumulated within the Company's Meter Data Management system (MDM), which is presently consuming more than 10 gigabytes per day in disk space. In addition, for disaster recovery and business continuity purposes, this data must be backed up and cloned to other systems and physical locations to ensure its integrity and availability--this effectively triples the amount of storage needed across the Company's data centers to maintain these systems and retain the ability to roll back or restore data in the event of an incident. Present data growth rates are exceeding the projected capacity of the existing storage environment and must be upgraded.
153494: 2018 IT Blanket	Project Type: Computer Hardware In-Service Month: 9 In-Service Year: 2018 Primary Purpose: Operational Efficiency Secondary Purpose: N/A Priority: Recommended Total Project Spending: $302,790	This project is the IT "blanket" and consists of purchases for small incidental, miscellaneous projects that we have every year due to failures, additional equipment and software needs and emergency replacements. The IT Blanket is intended to cover these purchases and the amount is based on a historical 5 year average of actuals.	The IT Blanket is appropriate as it provides GMP the flexibility to approve smaller, incidental and emergency capital requests for items that are expected throughout the year.
157385: 2018 AMI Infrastructure Refres	Project Type: Computer Hardware In-Service Month: 9 In-Service Year: 2018 Primary Purpose: Operational Efficiency Secondary Purpose: Customer Service Priority: Required Total Project Spending: $113,644	This project is for the annual installation of additional collection devices (gatekeepers and repeaters), that are needed to ensure GMP's Automated Meter Infrastructure (AMI) networks are working efficiently and supporting the customer, billing and outage management needs.	The AMI "mesh" network is subjected to constant change from foliage growth, new customer premises and the ratio and location of smart meters and legacy electromechanical meters ("opt out" customers.) These all affect the AMI network's ability to efficiently communicate from device to device and ultimately to the central office computers. As a result GMP must install additional collection devices, or gatekeepers, and repeaters, which serve as transfer points from one network device to another. Each year GMP analyzes the AMI network to determine where new gatekeepers and repeaters are necessary to ensure the network is satisfactorily serving business and customer needs related to billing, on demand viewing of electric usage and integration with systems such as outage management and engineering.
153495: 2018 Network Switch Rep	Project Type: Computer Hardware In-Service Month: 11 In-Service Year: 2018 Primary Purpose: Operational Efficiency Secondary Purpose: N/A Priority: Required Total Project Spending: $334,471	This project is part of the normal network equipment life cycle that GMP manages to keep our network performance acceptable. This project will replace nine existing Cisco distribution layer network switches at various locations. The equipment is being replaced because it is greater than 5 years old and is outdated technology. Distribution layer switches serve office users in our facilities. Upgrading these switches will provide a better end user computing experience by offering faster throughput at the closet level, as well as an upgraded uplink path (10Gb) not available in the current switches. Upgrading the uplink path increases throughput from the closet switch stacks to the core network infrastructure in the datacenter, eliminating bottlenecks and ensuring that enterprise applications perform in an optimal manner. The project will include configuration and implementation of nine new Cisco Catalyst 3650 POE (PowerOverEthernet) 10Gb Uplink Distribution Closet Switches to replace existing, end of life equipment. Project was partially accelerated into fiscal 2017 due to immediate replacement needs. The remainder of the project is being executed in fiscal 18, including additional plant locations that will be transitioning to a new wide area network provider and therefore, new routing equipment is necessary for connectivity. This project is on track and scheduled to close November 2018. Due to the acceleration in part, we are ahead of scheduled implementation and will likely have all equipment in service earlier.	As network switches approach an age of 5 years or more, they are outdated and do not have the latest features available in network switching speed or capabilities. In addition, at this age it is common to start seeing port and power supply failures resulting in system downtime and customer and user impact.

Project Number and Title	Additional Information	Project Description	Project Justification
159589: 19 IT Technology Refresh	Project Type: Computer Hardware In-Service Month: 9 In-Service Year: 2019 Primary Purpose: Operational Efficiency Secondary Purpose: Safety Priority: Recommended Total Project Spending: $245,539	This project will be used to purchase new end user technology to replace various technologies such as laptops, iPads, etc that are 3+ years old in the organization. Industry best practice on replacement of this type of technology is every 3-4 years.	An established hardware replacement cycle ensures that technology is operating as efficiently as possible by taking advantage of the latest technology available in processors, memory, networking throughput and operating system technology. This ensures stability, through faster equipment as well as updating the operating system to a current and supported version. By not replacing older technology on a regular basis, it will lead to an increase in troubleshooting of old equipment and system failures that have an operational impact on our users serving our customers in regular business interactions as well as storm restorations. Overall, the reliability and stability of aging equipment puts our systems and ability to serve our customers effectively at risk. Furthermore, newer operating systems are not supported on all older devices; leaving the devices and the company at risk for security vulnerabilities. It is appropriate to continue with the established hardware replacement cycle to replace outdated technologies. This process keeps the technology operating as efficiently as possible with reduced risk of failures. Hardware stability and reliability ensures our employees can continue to serve our customers on a day to day basis as well as during storm restoration. Newer operating systems, applications and security patches are not supported on older systems and could leave us open to security vulnerabilities.
159585: 19 CheckPoint Sec Mgmt Apls	Project Type: Computer Hardware In-Service Month: 12 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Required Total Project Spending: $107,416	GMP replaced 32 firewalls appliances in fiscal year 2018 (Project 153493). The firewall appliances for the enterprise are managed by one central system which was not replaced as part of the fiscal 2018 project. The centralized system is responsible for management of the enterprise of appliances, which includes correlation of security events. The existing management platform is no longer able to keep pace with the volume of event transitions it is processing. Due to resource constraints within the management appliances, critical event information and logs are being overwritten and the system is no longer capable of retaining more than six months' worth of transactions and event information. This project will replace aging firewall management hardware appliances as well as implement associated security management software required to manage the environment.	GMP is committed to protecting customer data and reliability of the grid. This project helps to advance GMP's security posture by installing new hardware and security management software that will improve the efficiency of the firewall management solution. Maintaining a secure network environment ensures the safety and integrity of our data and the electrical grid. Additionally, improving the management performance provides greater efficiency for operations and the corporate network by providing the required network resource faster and more efficiently.
159590: 19 Server Upgrades	Project Type: Computer Hardware In-Service Month: 12 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: N/A Priority: Recommended Total Project Spending: $132,889	The project is part of a multi-year plan to replace end-of-life servers that are between 5 and 7 year old and evolve into a regular 3-4-year server infrastructure replacement schedule based on industry best practices. GMP has established a server infrastructure replacement schedule based on industry standards of 3-4 years. An established hardware replacement cycle ensures that enterprise applications are operating as efficiently as possible by taking advantage of the latest technology available in processors, memory, networking throughput and operating system technology, as well as reducing the risk of system failures. System failures have an operational impact on our users serving our customers in regular business interactions as well as storm restorations. Replacement of these servers will ensure the infrastructure responsible for server enterprise applications remains stable and reliable for our users. In addition, some of the hardware is out of warranty and due to its age, we are unable to extend warranty coverage. Equipment of this age is at a greater risk of hardware failure and without support from the vendor; parts and repair may be unavailable, causing extended or permanent system failure. This project will be used to purchase 8 new Dell Server and Chassis which are approaching end of life.	It is appropriate to continue to replace outdated technologies in order to keep technology up to date and reliable for our applications for day to day business functions as well as storm restoration. GMP replaces servers every 3-4 years and chassis as they come to end of life. Replacing servers on a schedule will avoid large hardware purchases each year and continue to spread them out to each year having smaller purchases.
Computer Hardware - Rate Period (Jan. - Sept. 2019)			
159566: 19 Disk Storage Prod DBs Rut	Project Type: Computer Hardware In-Service Month: 7 In-Service Year: 2019 Primary Purpose: Operational Efficiency Secondary Purpose: N/A Priority: Required Total Project Spending: $348,570	The purpose of this project is to increase and upgrade disk storage capacity for multiple systems residing on the Company's NetApp Storage Area Network (SAN). Additional shelves and discs are required to: replace drives that have aged out and are no longer supportable, expand storage volumes for security video aggregation, add capacity for Delphix/Oracle production database clones, and account for ordinary incremental growth within all application environments. Older disks will be removed from the system New disks will be added and aggregated Data will be directed to the new volumes	The existing storage environment is near 80% of capacity and also contains a substantial collection of disks that have aged out and are no longer supportable. Additionally, data volumes continue to grow as application, AMI, backup, and analytics volumes follow their normal growth trajectory. The GMP SAN environment is a real-time storage and compute platform that is critical to operations and is the infrastructure within which the majority of the Company's data, virtual server environments, databases, and applications are housed and delivered.

Project Number and Title	Additional Information	Project Description	Project Justification
153487: 19 Network Core Enhancements	Project Type: Computer Hardware In-Service Month: 9 In-Service Year: 2019 Primary Purpose: Operational Efficiency Secondary Purpose: N/A Priority: Recommended Total Project Spending: $241,413	This project is required to upgrade and expand the network switches in the Rutland and Colchester core network systems in order to support planned expansion of enterprise systems in 2018 and 2019. As the demands on local area network bandwidth grow, these new switches will allow us to upgrade current network paths to larger, faster paths, and will increase the total number of paths available for use from enterprise infrastructure to the core network switches. The impact of these changes will be increased system performance and user experience, and productivity enhancements within the enterprise applications of the organization. The execution of this project will include design and planning for the installation of 2 new switches in Colchester and 4 new switches in Rutland. Colchester: Two top of rack Cisco Nexus 2348UPQ Copper switches. The top of rack switches will be in addition to existing top of rack technology already in production in the Colchester datacenter. These additional switches are needed to increase capacity. Rutland: Two distribution layer Cisco Nexus 5696 switches with 10 and 40Gb expansion cards, and two top of rack Cisco Nexus 2348UPQ Copper switches. The distribution layer switches will replace existing Cisco 5672 switches which do not have available capacity for infrastructure growth needs. The Cisco 5672 will be relocated to the Montpelier datacenter to replace Cisco 5548 switches which are nearing end of life. The top of rack switches will be in addition to existing top of rack technology in the Rutland datacenter. These additional switches are needed to increase capacity.	The existing distribution layer switches in Rutland, as well as the top of rack network appliances in both the Rutland and Colchester data centers are nearing capacity. As we add new devices and applications in our enterprise over the next couple of years, the lack of available capacity will prohibit us from expanding our infrastructure. This expansion will ensure that network services are available when needed.
159550: 19 IT Blanket	Project Type: Computer Hardware In-Service Month: 9 In-Service Year: 2019 Primary Purpose: Operational Efficiency Secondary Purpose: N/A Priority: Required Total Project Spending: $306,727	This project is the IT "blanket" and consists of purchases for small incidental, miscellaneous projects that we have every year due to failures, additional equipment and software needs and emergency replacements. The IT Blanket is intended to cover these purchases and the amount is based on a historical 5 year average of actuals.	The IT Blanket is appropriate as it provides GMP the flexibility to approve smaller, incidental and emergency capital requests for items that are expected throughout the year.
159554: 19 Sub Phys Access Ctrl Sys	Project Type: Computer Hardware In-Service Month: 9 In-Service Year: 2019 Primary Purpose: Safety Secondary Purpose: Operational Efficiency Total Project Spending: $411,660	This project will implement a centralized, server-based digital key and lock management system that will significantly improve the auditability and security of the Company's critical plant and substation assets. In addition to the server infrastructure, the project includes incrementally replacing existing substation and plant key/lock systems with a digital padlock infrastructure. Features of this new security system include real-time, managed access control to facilities, the ability to remotely activate/de-activate access, the ability to instantly revoke access, as well as meet other audit and compliance expectations for physical security. Locks and keys will be registered in a centralized server environment. Locks will be replaced at plant and substation locations. Keys will be assigned to individuals and older keys/locks will be retired.	The inability to adequately and fully audit or control access to our plants and substations has been highlighted as a risk in third party security audits. Going back to the merger between GMP and CVPS in 2012, the distribution of keys to employees and others has been an area of improvement as the whereabouts and possession of all keys should be more accurately documented and managed. This project will baseline physical access control and locking, and negate the efficacy of any lost or untracked keys, or those that were not properly retrieved upon employee retirement, dismissal, etc.
159560: 19 AMI Infrastructure Refresh	Project Type: Computer Hardware In-Service Month: 9 In-Service Year: 2019 Primary Purpose: Operational Efficiency Secondary Purpose: Customer Service Priority: Required Total Project Spending: $132,758	Annual installation of additional collection devices gatekeepers and repeaters as needed to ensure GMP's Automated Meter Infrastructure (AMI) networks are working efficiently and supporting the customer, billing and outage management needs. It is estimated GMP will add 150 new units in fiscal 2019.	The AMI "mesh" network is subjected to constant change from foliage growth, new customer premises and the ratio and location of smart meters and legacy electromechanical meters ("opt out" customers). These all affect the AMI network's ability to efficiently communicate from device to device and ultimately to the central office computers. As a result, GMP must install additional collection devices, or gatekeepers, and repeaters, which serve as transfer points from one network device to another. Each year GMP analyzes the AMI network to determine where new gatekeepers and repeaters are necessary to ensure the network is satisfactorily serving business and customer needs related to billing, on demand viewing of electric usage and integration with systems such as outage management and engineering.

Project Number and Title	Additional Information	Project Description	Project Justification
159565: 19 Video Surveillance Systems	Project Type: Computer Hardware In-Service Month: 9 In-Service Year: 2019 Primary Purpose: Safety Secondary Purpose: Reliability Priority: Recommended Total Project Spending: $104,141	This project represents a multi-year initiative to extend enterprise video surveillance to various sites around the state. The purpose of this surveillance is for security (theft deterrent) and safety. We have had theft from multiple service centers in recent years. This includes copper, batteries from vehicles, four wheeler off road vehicles and tools from trucks. The following sites are the locations where video surveillance will be added or enhanced for this year. 33 Cameras total will be installed. 1. Electrical Maintenance Office, Rutland: Replace 11 existing fixed cameras with pan-tilt-zoom (PTZ) type cameras. The existing cameras are at end of life and not compatible with our existing enterprise video surveillance system. 2. Sunderland: Install 4 PTZ security cameras on the exterior of the building and 5 fixed cameras on the man doors 3. Brattleboro: Install 4 exterior PTZ cameras and 4 interior fixed cameras on the man doors 4. Westminster: Replace existing Network Video Recorder with 2 cameras. The current system is down and no longer repairable. 5. Kendall Farm: Replace existing 3 cameras with units compatible with the enterprise system. GMP has made a significant investment in an enterprise wide video system (Milestone). All video units will be added to this surveillance and recording network that is currently operating.	This project represents a multi-year initiative to extend enterprise video surveillance to various sites around the state. This project is a continuation of a larger implementation plan that has been in progress for 2 years. The sites chosen represent areas where there have been issues with theft or where the existing equipment is no longer capable of functioning properly. We have incidents of unauthorized persons climbing in dumpsters and on the property looking to take scrap copper and aluminum. This is a safety hazard we are looking to prevent. We also have had incidents of batteries and or tools stolen from vehicles that are parked outside. This inhibits the line crew's abilities to respond to customer needs in a timely manner. This project is for the reduction of theft and for the safety of the public.
159572: 19 Cell Amps Plant & Subs	Project Type: Computer Hardware In-Service Month: 9 In-Service Year: 2019 Primary Purpose: Operational Efficiency Secondary Purpose: Safety Priority: Recommended Total Project Spending: $104,580	The 2019 Cellular Amplification System project for Plants and Substations is the third phase of work that was started in 2017. This is a continuation of projects 148474 (2017) and 153620 (2018) in which we budgeted for and executed the installation of these systems at multiple sites around the state. This phase is scoped for the installation of cellular amplification equipment at 35 plants or substations. The systems will include two amplification nodes for AT&T and Verizon service boosting, as well as antenna equipment, cabling, installation, configuration and implementation service. Working with the managers of Substation Operations and Power Production, we will prioritize sites based on greatest need and areas of safety concern. Each site will be tested for qualification to ensure it meets minimum signal criteria. Qualifying sites will then go through design, implementation tuning and testing phases. This work will include a combination of outside services labor and internal resources in IT.	Cellular technology has become a primary channel of communication for our field-based employees as well as a backup communication channel for traditional land lines in the event of a land-line system or voice circuit outage. Similar to the project we've done on the corporate side (district offices) of our operation, deployment of multi-carrier cellular amplification systems at various plants and substations will ensure cell users have sufficient coverage and signal strength to use cell phones as a primary communication tool. Cell phones are used for every day power switching orders, business communications, storm work as well as emergencies if needed. In addition to our own employees working regularly at these sites, it's common for contractors to work alongside us during regular business work as well as outage work. It is critical for workforce safety that individuals working at our sites and facilities have the ability to communicate and to call for help in the event of an emergency. GMP has a company-wide field safety improvement plan and these systems are a component of that overall plan. We are implementing these systems over several years until we have implemented the required primary and secondary communication methods in the field-based generation plants and substations that have been identified for these improvements. All GMP field personnel working in plants and substations carry a company issued cell phone. It is critical that these tools work for our users regardless of their location in the field, including in our substations and plants. Although we've seen growth in the cellular carrier coverage footprint in the state over the past few years, most of our plants and substations have seen only minimal signal improvements, still not capable of providing strong and reliable communications. The implementation of these systems allows us to work with a base level of carrier signal and maximize the effectiveness.
Computer Software - Interim Period (Oct. 2017 - Dec. 2018)			
155810: 2017 Website Enh phase 2	Project Type: Computer Software In-Service Month: 4 In-Service Year: 2018 Primary Purpose: Customer Service Secondary Purpose: Operational Efficiency Priority: Required Total Project Spending: $426,274	This project will enhance GMP's website by improving the design and functionality of products and services pages and improving the design and functionality of the outage center and maps. The scope of work for the products and services pages will include: • Updating the look and feel of the products and services pages to use more visuals in smaller content chunks. • Creating illustrations to explain how the products and services work. • Development and implementation of the new pages on the content management system based on new design. The scope of work for the outage center and maps enhancement will include: • Visual design updates to the map to allow better context for users, making roads and landmarks more visible. • Improving usability of the map by considering progressive enhancement on slower devices, switching to Map box as the map provider, improving functionality on middle and small size screens. • Giving users more information including specific outage incidents, outage causes and restoration times. Allow users to report their outages and view updates right in the outage center.	It is important to regularly improve and enhance the Company's web site to keep current with changes in technology, security, and programming, as well as to simplify the customer user experience by making information and resources available in a more seamless and useful way. This in turn cuts down on calls coming into the call center and allows customers to interact with us by the means of their choosing 24/7.

Project Number and Title	Additional Information	Project Description	Project Justification
148480: 2017 Cust Self Service Enhance	Project Type: Computer Software In-Service Month: 10 In-Service Year: 2017 Primary Purpose: Customer Service Secondary Purpose: N/A Priority: Required Total Project Spending: $253,601	In order to better serve GMP customers, support changing web browser and security requirements, and to support changing business process requirements, the customer self-service portion of the GMP website must be continually enhanced, refreshed, and upgraded. In 2017, the Company focused on improving elements of the user experience for customers visiting the Company's customer web portal by offering: Registration page design updates for consistency for cross-site compatibility/navigation Reset password workflow design update Make payment (not logged in) design update Move in/Start service functionality Ability to manage recurring ACH payments Rate comparison section Budget billing capability Ability to update mailing address Specific feature needs and requests were gathered, documented and assigned to development resources for code development, design, content creation, integration, and testing. Completed enhancements were moved to a staging environment for browser testing, and finalized functional pieces were moved to production either as they were ready or at project completion.	The GMP customer web site needs to integrate continual functionality and user interface enhancements to stay abreast of customer needs and desires in terms of how they interact with GMP via the web, to accommodate for changes in web browser technology, to provide new functionality that diminishes the need for manual intervention, and that furthers GMP's goal of making as many customer interactions as possible available through self-service. The functionality outlined above was necessary to keep GMP's website current and meet customer needs.
148489: 2017 GMP API	Project Type: Computer Software In-Service Month: 10 In-Service Year: 2017 Primary Purpose: Customer Service Secondary Purpose: Operational Efficiency Priority: Required Total Project Spending: $500,944	An Application Programming Interface, or "API", is a computer system that allows other computers to send and receive messages and instructions. APIs typically enable the automation of business functions, provide analytics for mobile apps and web sites or provide event-based messaging and notifications. There are several techniques for creating APIs. GMP has chosen to create web services using an industry-standard method called REST (Representational State Transfer). REST uses a light-weight HTTP protocol to exchange messages using plain JavaScript Object Notation (JSON). In order to respond to changing business and customer needs, GMP began building a secure REST-based web service API in 2015 that provides features and data to GMP's web and mobile properties. To date over a hundred API services have been created and deployed into production. In 2016 the demands on this service layer continue to increase as both GMP and our partners need access to secure and high-performing data services. The development of the GMP API layer continued in FY17 to keep up with the demand for web services. This project was submitted in the 2017 rate case, but the overall scope was reduced to exclude the customer notification system and monitoring services within CSS. This was largely driven by the unavailability of external resources that were previously planned for, but could not be contracted.	In the world of computing, machines communicate with other machines by sending messages to and from listeners called "services". A service has a name and a web address (URL) and typically performs a computing task such as "add a customer" or "delete and invoice". Messages can be sent using a variety of data formats and GMP has chosen to adopt the popular REST standard for exchanging messages between services. Our focus is on providing a secure, high performing set of REST services to GMP apps and third parties, enabling new capabilities such as home automation, analytics and self-service features. Having a single entry point into GMP for all external systems allows GMP to properly monitor and govern access to key enterprise systems.
148492: 2017 GMP Web Framework	Project Type: Computer Software In-Service Month: 10 In-Service Year: 2017 Primary Purpose: Operational Efficiency Secondary Purpose: Customer Service Priority: Required Total Project Spending: $142,953	Currently GMP has deployed several custom web applications to benefit various business units throughout the company. These apps include: • Controller Notes • CSR web portal • Easements • Corporate Contracts • Outage Portal • Meter ping tool Typically a custom app either requires a custom username/password to access, or does not require any authentication. Building a custom authentication mechanism for each application is expensive to maintain and does not provide adequate security. To address the issue of security and maintenance, a new web framework was built that provides Enterprise quality identity management along with role-based security to ensure users access only the content they are authorized to see. Each individual application was then retro-fitted to use the new GMP web framework. This project included the construction of the web framework, integration with Active Directory and StormPath (later custom built security management after Stormpath API shut down) for identity management and the integration of custom web apps into the new framework.	The number of custom-build applications continued to rise. By leveraging a common web framework, each existing and future application was able to leverage security and a common web harness that cut away many common development tasks, allowing developers to focus on true business value.

Project Number and Title	Additional Information	Project Description	Project Justification
153516: 2017 Enterprise Sec Devic Soft	Project Type: Computer Software In-Service Month: 10 In-Service Year: 2017 Primary Purpose: Reliability Secondary Purpose: Customer Service Priority: Required Total Project Spending: $40,400	This project enhances GMP's ability to better protect laptops from computer security threats. Software was installed on every laptop to provide full disk encryption, media encryption, port protection, anti-malware (bot-checking), compliance, Uniform Resource Locator (URL) filtering, firewalls, virtual private network (VPN) control, and application whitelisting. Software will provide next-generation anti-virus protection, and complete visibility into end points for incident response and proactive threat hunting. This project extends GMP's enterprise security capabilities by implementing a security capability on all GMP mobile devices and end points. As information technology has evolved, organizations have become much more mobile. Employees work from laptops outside the network walls that once confined the conventional workstations. This mobility introduces a multitude of security risks. An organization's security posture is only as secure as the end points. This project will enhance GMP's security posture, better protect customer data, and provide additional layers of security to help protect the grid. The software installed contains three components: CheckPoint Endpoint Security, Carbon Black, and Cylance.	This project is appropriate at this time because the threats facing the electric industry are increasing and the adversaries trying to do harm are becoming more sophisticated and daring. Previously, GMP did not have a comprehensive solution in place and this project will address that need.
153813: 2017 Watershed Forecast Tools	Project Type: Computer Software In-Service Month: 10 In-Service Year: 2017 Primary Purpose: Operational Efficiency Secondary Purpose: Regulatory Compliance Priority: Required Total Project Spending: $57,523	ISO New England is the electric grid operator for utilities in New England. GMP is required to comply with their dispatch requirements for the generation of hydro-electric power at GMP-owned sites. Specifically, 10 sites must comply with the Desired Dispatch Point (DDP) and 8 sites must comply with the Do Not Exceed (DNE) obligations. This project allows for more accurate watershed forecasting by enabling our Control Center Operators to complete the required 'day-ahead' hydro generation forecast that is required to be submitted to ISO each day. This project is Phase I of a multi-phase project. Phase II will occur in fiscal 2018 which will extend this technology to the Lamoille and Otter Creek sites. Although originally planned as a three phrase project, it is now expected that all needs will be implemented in just two phases.	The project was necessary at this time as GMP is required to submit a more accurate and detailed day-ahead hydro generation forecast to ISO New England. The project involved the development of hydro modeling the Winooski River Watershed to provide an accurate forecast of available hydro generation in our ponding facilities and our run-of-river facilities. The work involved an outside consultant developing the watershed-based hydro model in conjunction with data available from the USGS sites and our BI Team. Currently, our Control Center will receives a more accurate daily forecast which will increase can GMP's ability to generate more hydro-electric power along the entire watershed.
148551: 2017 Digital Fault Recorders	Project Type: Computer Software In-Service Month: 2 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: N/A Priority: Required Total Project Spending: $52,655	This project is an upgrade to our Digital Fault locating software used to poll the Digital Fault Recorders currently installed in the field that provide fault information and detailed Transmission system statistics for analysis. These recorders assist with finding the distance to a fault on the Velco Transmission system and our sub-transmission system and other system abnormalities. The software reduces outage time by pointing line crews to the fault location for faster resolution. In order to obtain and analyze Fault Records from our Transmission provider Velco, we had to upgrade the system to be able to read fault record information from them due to an upgrade in their system. The project involves the installation of the new software on a server, client installations of the desktop software for access by engineering and Relay technician employees, installation of serial to Ethernet converters in 5 locations in order to capture fault information from them, configuration changes in 4 new locations to obtain fault information, establishing a secured connection to Velco to obtain their fault record information from their Transmission system, and vendor support for configuration and setup of the system.	Without the upgrade we have no way of analyzing this fault information, which assists in reducing the outage time by pointing line crews to the fault location for faster resolution. It also automates the fault collection via an Ethernet connection, monitors & reports on the health of the connection & DFR device and removes the SCADA Engineers from having to access the information manually by providing the desktop software directly to the end user for immediate access and analysis. This upgrade is necessary in order to be able to read Transmission fault records from the Velco transmission system given an upgrade they completed on their system, as well as to access fault records on our own Transmission system. It is necessary to implement this new software in order to maintain access to fault records for faster response and resolution to outage events to maintain a reliable electric grid and provide the best service to our customers. In addition, we had to use a manual method of fault record collection on our Transmission system that added resource time to complete and added time to respond to fault events and ultimate outage resolution. This new system will provide much faster response and resolution of fault events. The system also provides access to data for analysis on the transmission system.
155811: 2017 GMP Intranet	Project Type: Computer Software In-Service Month: 3 In-Service Year: 2018 Primary Purpose: Operational Efficiency Secondary Purpose: N/A Priority: Required Total Project Spending: $46,674	This project is to create a new GMP Intranet site on a WordPress platform and migrate the content on the current GMP intranet site, GMP Connects, which resides on a SharePoint platform. An internal intranet site provides a central location for all employee-only documents, policies, procedures and links to be used by employees company-wide. The current version of SharePoint is no longer supported and therefore needs to be shut down and removed from our environment. WordPress is being utilized for the corporate website and for efficiency and consistency; the intranet site will also be on WordPress. The scope of work will include: • Working with company departments to audit current content. • Update the look and feel of the site while keeping structure consistent with the content that is out there. • Develop and implement new site on the content management system.	As stated above, since the current version of SharePoint is no longer being supported, it is necessary to shut down the old SharePoint site. Moving the intranet onto WordPress will be consistent with all the other web applications we have in the company, allowing for better consistency and efficiencies.
153509: 2018 Cent Sec Event Log Sol	Project Type: Computer Software In-Service Month: 7 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Required Total Project Spending: $191,177	This project will enable GMP to enhance the centralized logging solutions on the corporate network. This project will require the upgrade of servers in the virtual environment and the installation of new core logging software (Splunk and Splunk Enterprise Security add-on). The new logging solution will then be tuned and queries, alerts, reports, and security dashboards will be developed. This project improves GMP's enterprise wide information security infrastructure consistent with our cyber security plans and will provide a centralized repository of security logs and build in automated analysis looking for adverse events. In the event of a security incident, this centralized repository will provide the incident handlers the ability to piece together the security incident and quickly determine appropriate actions.	The continued expansion of GMP's security posture requires investment in new tools and technology for managing the security of our networks. In the event of a security incident, having a centralized logging solution is essential in the response process. Splunk's centralized logging solution and Enterprise Security add-on provides insight into machine data generated from security technologies such as network, endpoint, access, malware, vulnerability and identity information. It enables security teams to quickly detect and respond to internal and external attacks to simplify threat management while minimizing risk and safeguarding the network. This is critical to protecting our systems and customer information.

Project Number and Title	Additional Information	Project Description	Project Justification
153523: 2018 MWM Upgrade	Project Type: Computer Software In-Service Month: 7 In-Service Year: 2018 Primary Purpose: Operational Efficiency Secondary Purpose: Customer Service Priority: Required Total Project Spending: $144,094	The scope of this project is to upgrade Mobile Workforce Management (MWM) 2.3 to Service Pack 2 and implement Mobile Communications Platform (MCP) which will allow GMP end users to run the mobile client natively on their iOS devices (i.e. iPads). The Oracle Utilities Mobile Workforce Management (MWM) provides an integrated, real-time, planning, scheduling, dispatch, mobile communications and performance analytics solution. It optimizes the deployment of field workers and enhances visibility and control of assets. GMP is currently using MWM for Meter Reader Installer field work.	The primary justification for this project is operational efficiencies, with additional benefits to customer service. MWM provides an integrated, real-time, planning, scheduling, dispatch, mobile communications and performance analytics solution for our Meter Reader Installer field work. It optimizes the deployment of field workers and enhances visibility and control of assets. GMP completed the upgrade of MWM version 2.3 in FY 2017, which made available the new MCP (Mobile Communications Platform) functionality. This project is continuing to evolve the system by upgrading to service pack 2 for version 2.3 and implementing the new MCP which will allow GMP to streamline processes and reduce manual work. Because of our rural service territory, field workers lose connectivity in certain areas and it hinders their use of technology, which causes them to use manual workarounds such as printing paper and writing notes to prepare for connectivity issues they know they may face that day. Some field workers will hold the work they have done manually until the end of the day before they input it into the system. The manual workarounds result in reduced field time and errors in data entry.
156854: 2018 OT Control & Data Bus	Project Type: Computer Software In-Service Month: 8 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Innovation Priority: Required Total Project Spending: $533,569	The Operations Technology Control & Data project will create the tools and connectivity that are needed to securely allow GMP's SCADA application to communicate with applications residing outside of GMP's SCADA network. The control bus will allow external applications to securely send control operations to the SCADA system so that commands can be then be sent to field devices such as utility-grade energy storage for execution. Similarly, the data bus will allow telemetry and status information received by the SCADA system from field devices to be shared with applications residing outside of the SCADA network. The initial scope of work will focus on installing the control and data bus software and using the control/data bus components to use utility-grade battery storage in Panton to reduce system peaks and ISO frequency regulation, with the intention of installing these controls at other sites in later projects. This project's scope of work includes the following: • The Control / Data Bus Software will be installed on GMP's IT infrastructure. • The Control / Data Bus will be configured to interface with GMP's internal Grid application. This application will interface with an external energy optimization engine developed by Tesla. The optimizer will use weather, historical load, and current load information to forecast future peak load periods and generate dispatch plans to optimize how the Panton Battery Storage System is used based on forecasted grid conditions. • The Control and Data Bus will be configured to securely interface with the existing SCADA application. The configuration will allow control, data, and tagging information to be exchanged with the Tesla application. • The ICCP (inter-control center communications protocol) network traffic that currently is routed through the SCADA Master will be moved to new, separate ICCP servers. This will help balance load and prevent bottlenecks that could affect the performance of the SCADA Master or ICCP servers. • Testing will be done to ensure that the redundant SCADA and control/data bus components installed in the Rutland and Colchester data rooms will transfer to the backup site properly in the event of a component failure at the primary site.	The rapid growth of distributed energy resources (DERs) in recent years is blurring the lines between Corporate and SCADA applications. The new energy paradigm is challenging the historical role of SCADA as the sole system that is responsible for managing field devices. The emergence of utility-grade energy storage, residential storage, and other behind-the-meter devices requires that Corporate applications such as GIS, SCADA, and other third-party applications be able to communicate with one another. Expanding renewable generation, managing intermittency and reliability, and reducing costs with a new class of resources requires allowing SCADA and other applications to collaborate more actively with one another. With DER growth forecasted to continue at a rapid pace, it's critical that GMP adapt the existing SCADA architecture to accommodate this new class of grid resources. Implementing a control / data bus will provide new capabilities and benefits that are critical to continued innovation: 1. A control / data bus will allow GMP to adapt much more quickly as distributed energy resources and the systems that support them continue to come to market and evolve. 2. Implementing a control / data bus will allow GMP to reuse existing SCADA networks and infrastructure. Absent a bus, GMP would need to create separate, redundant infrastructure to securely connect SCADA to new applications. Using a control / data bus that reuses existing infrastructure is much more efficient and cost effective. 3. Reuse of existing pathways will allow GMP to deploy new DERs such as utility-grade storage more quickly and cost-effectively.
153507: 2018 C&I Portal	Project Type: Computer Software In-Service Month: 9 In-Service Year: 2018 Primary Purpose: Customer Service Secondary Purpose: N/A Priority: Required Total Project Spending: $235,822	This project will give customers a user-friendly, self-service tool to access the data and information they require for their businesses. Currently C&I (Commercial and Industrial) customers can only access billing information one month at a time. They frequently need access to data over a much longer period of time, as their bills are complex and it is important for them to be able to see how their energy use, including kwh and demand, and costs change over time. This project is an enhancement to our website to give C&I customers access to their account information and enable them to create custom reports based on their needs. This will enable them to be much more aware of their usage and costs over time, which will help them run their businesses more efficiently. Examples of reports that would be available via this new portal, which a customer could download on demand, include: 1) annual summary of usage in CSV (comma separated values) or excel format, and 2) interval data in kw or kwh format.	In today's business environment and the world of on-line services, customers expect to access data about their own account the moment they need it and not depend on GMP staff to provide it. We have been asked by customers for a number of years to provide this service. The ability for customers to get data in a user-friendly way would help them achieve their efficiency objectives and forecasting for budget purposes and would be better customer service. Businesses we serve have reporting obligations and the usage data from month to month and year to year is something they cannot access directly from our website. The only way it is available is for GMP staff to manually produce those reports and send them to each customer. This is not a customer-friendly approach and it is time consuming. It is important for our customers to easily get these reports quickly, when they want them, without depending on GMP staff to produce.

Project Number and Title	Additional Information	Project Description	Project Justification
153508: 2018 CCB & MDM Upgrade	Project Type: Computer Software In-Service Month: 9 In-Service Year: 2018 Primary Purpose: Operational Efficiency Secondary Purpose: N/A Priority: Required Total Project Spending: $735,303	The scope of the project is to upgrade the current version of Oracle Utilities Customer Care and Billing (CC&B) application and Meter Data Management (MDM) to the latest versions in order to access additional functionality, extend the life of the software and retain access to Premier support. CC&B is a Customer Information System that is a complete billing and customer care application handling every aspect of the customer lifecycle, from service connection to payments processing and everything in between. MDM is an application that supports the loading, and validation-editing-estimation (VEE) of meter data. It manages the meter data and pushes it to CC&B for billing purposes. Some of the new features we will have with the upgraded versions of CC&B and MDM are as follows: - Enhanced exception management ("To Dos") - More Integration capabilities - Improved credit and collection functionality - Outage Storm Mode - Helps ensure Meter Data Management does not create bill determinants when Automated Meter Infrastructure (AMI) systems fail - Configuration of complex validation-editing-estimation (VEE) rules on meter data without programming	GMP historically implements the most current, supportable versions of our application software and this upgrade will keep us in good standing with the Oracle product road map and support access. Oracle Premier support for CC&B (Customer Care & Billing system) Release 2.4 SP3 ended on 11/30/17 and Premier support for MDM (Meter Data Management) ended on 1/31/18. Upgrading allows us to stay on Premier support, which means we will continue to have access to new updates, fixes, security alerts, data fixes, and critical patch updates and eliminate the need for Extended Support, which would be an incremental 20% increase (approximately $133k) over what we are currently paying for Premier support. Also, the new functionality identified in the "Project Justification" section will provide the ability to improve operational efficiency.
153515: 2018 EBS Enhancements	Project Type: Computer Software In-Service Month: 9 In-Service Year: 2018 Primary Purpose: Operational Efficiency Secondary Purpose: Customer Service Priority: Required Total Project Spending: $158,605	The Oracle E-Business suite of applications (EBS) is GMP's financial system. The purpose of this project is to enhance the application by adding new features and functionality so GMP can gain operational efficiencies. GMP upgraded EBS to version 12.2.5 in May 2017, which exposes new functionality that will allow GMP to continue to streamline processes and get the most out of the system. The scope of this project is to undertake multiple enhancements that will add new features and functionality to EBS application. Some enhancements that have been identified are: - Various Timecard enhancements - Optimize Requisitioner and Receiving Workflow Emails - EBS Integration to BSwift (new HR Tool) - ADP Indicative Data Interface - Purchasing Tolerances - Mobile App iExpense - Sub-inventory on stock items entered on requisition The majority of the work will be done with external resources.	As features, capabilities and specifications change from the business, it is essential that the GMP EBS application is enhanced to provide additional functionality and to keep up with changes in the business. This project will allow GMP to continue to evolve its Financial system by turning on new functionality, which will accomplish more work with fewer resources.
153521: 2018 M2C Enhancement	Project Type: Computer Software In-Service Month: 9 In-Service Year: 2018 Primary Purpose: Customer Service Secondary Purpose: Operational Efficiency Priority: Required Total Project Spending: $392,433	The scope of this project is to undertake multiple enhancements that will add new features and functionality to Oracle Utilities M2C (Meter-to-Cash) which consists of Customer Care & Billing (CCB), Meter Data Management (MDM), Mobile Workforce Management (MWM) and Operational Device Management (ODM). Enhancements that have been identified will improve: Group Billing Automations, Curtailable Rate Transitions, Streamlining of MDM usage groups, Net Meter Regulatory Changes, Bundle Billing enablement, Energy Transformation initiatives, Credit & Collections for Group Net Metering, Solar Meter Install Process efficiencies, Rates Changes driven by rate case and Street Light Consolidation, and automation of premise setup. The majority of the work will be done with external resources.	Due to the evolving statutory and regulatory requirements in Vermont, it is necessary for GMP to add certain customized capabilities to its Meter-to-Cash applications. By adding new features and functionality, GMP can remain in compliance with Vermont requirements in an efficient manner while gaining operational efficiencies. The continued evolution of these Oracle applications is necessary to operate as efficiently as possible, provide better customer service and to comply with regulatory-driven requirements.
153526: 2018 Sec Baseline Software	Project Type: Computer Software In-Service Month: 9 In-Service Year: 2018 Primary Purpose: Safety Secondary Purpose: N/A Priority: Required Total Project Spending: $302,742	This project will allow GMP to track IT system baselines throughout the life cycle of the device in question and help to ensure that vulnerabilities are not introduced due to updates and daily administration. An organization's Information Security posture is composed of multiple defensive layers. The layers are implemented at a point in time to ensure their purpose. The implementation is done using industry best practices, and this state of operation is considered the system baseline. As time goes by, the configuration and files installed on a device change due to daily administration and software upgrades. These changes can have unintentional consequences and can result in the introduction of security vulnerabilities. This project will enhance GMP's ability to detect deviations in a system's baseline. A new virtual server will be installed. The Tripwire Enterprise will be installed on the new virtual server. The Tripwire Whitelist Profiler and TE (Tripwire Enterprise) Commander will be installed. Once the new virtual server is completed, agents will be deployed to all windows desktops and servers using GMP's software distribution technology. Upon completion of the agent deployment, each system will automatically register with the Tripwire Server. Agentless systems will be manually configured on the new Tripwire Server. At this point, system baselines will be developed based on the Whitelist Profiler and using security templates from the Center for Internet Security. Security dashboards, reports, and alerts will be developed to detect, report, and alert on deviations in the initial baseline.	The U.S. Department of Homeland Security (DHS) reports that cyber-attacks on the electric grid system are increasing in both frequency and sophistication. This project will provide GMP and our customers with a layer of defense that we currently do not have. This project will improve GMP's security and safety focus, move it to a more proactive state, and help to provide the tools needed to defend against the increase in both threats and sophistication facing the electrical grid.

Project Number and Title	Additional Information	Project Description	Project Justification
153529: 2018 Watershed Forecast Tools	Project Type: Computer Software In-Service Month: 9 In-Service Year: 2018 Primary Purpose: Operational Efficiency Secondary Purpose: Regulatory Compliance Priority: Required Total Project Spending: $99,667	ISO-New England is the electric grid operator for utilities in New England. GMP is required to comply with their dispatch requirements for the generation of hydroelectric power at GMP-owned sites. Specifically, 10 sites must comply with the Desired Dispatch Point (DDP) and 8 sites must comply with the Do Not Exceed (DNE) obligations. This project will allow GMP to have accurate watershed forecasting to enable our Control Center Operators to complete the required 'day-ahead' hydro generation forecast that is required to be submitted to ISO each day. This is the next phase of this multi-year, multi-phase project. Phase 1 - Winooski was completed in 2017 and this phase of the project is to continue with Lamoille and Otter Creek. It was originally anticipated that there would be a third phase in fiscal 2019, but that additional work will no longer be needed so this second phase of the project will complete the watershed forecasting initiatives.	The project is necessary at this time as GMP is required to submit a more accurate and detailed day-ahead hydro generation forecast to ISO-New England. The project involves the development of hydro modeling for our watersheds combined with software to provide an accurate forecast of available hydro generation in our ponding facilities and our run-of-river facilities. The work involves an outside consultant developing the watershed-based hydro model in conjunction with data available from the USGS sites and our BI Team. Upon completion, our Control Center will receive a more accurate daily forecast, which will increase GMP's ability to generate more hydroelectric power along the entire watershed. This project will improve the reliability and efficiency of our Power Planning team, Control Center and Generation team and lastly, improve our ability to generate revenue for the benefit of customers.
153628: 2018 GMP Mobile App Enhance	Project Type: Computer Software In-Service Month: 9 In-Service Year: 2018 Primary Purpose: Customer Service Secondary Purpose: N/A Priority: Recommended Total Project Spending: $267,787	GMP is committed to offering customers a variety of service channels that meet their communication needs. The GMP mobile application continues to be an important part of the GMP self-service offering with nearly 39,000 installations to date. The app will continue to grow in importance as customers continue to expect that all functionality available on our website site is also available on a mobile device. In order to keep up with this demand, continued investments must be made in the mobile app to support features available through the customer self-service site as well as making sure the app is up to date with latest mobile design standards and in line with the current GMP design patterns. Adding new features to the existing app as well as yearly support has proven to be very costly as the app is maintained by the original vendor who developed it. GMP follows an agile approach to software development, continually adding new features and releasing them more often. The vendor who supports the app does not follow this same approach, instead wanting to undertake very large, expensive projects to add new features. GMP customers expect, and deserve, to have features added to the app as they become available on the GMP customer self-service website. Redesigning and redeveloping the app will provide the foundation for GMP to take over support and maintenance of the app, allowing for much more timely updates to the application. This project will be to rebuild the current mobile application using the React Native framework, a hybrid mobile app framework app that allows the same code base to target iOS and Android, allowing GMP to maintain the app with current staff once built.	The demands of GMP's mobile customers continue to grow. As technology evolves and we offer more features and functionality to the customers through various technology methods, it's important that we remain consistent in offerings across the technology platforms we offer for customers to communicate with us. Specifically, this project scope includes adding features and functionality to our mobile application, which we are offering within our customer self-service website. Keeping these consistent ensures a smooth and consistent experience for our customers regardless of the method they select each time they are in need of service. This project was originally scoped to add new features utilizing the existing vendor, iFactor. Although iFactor has provided a great product to build upon in the future, the current application and code are proprietary to this provider. It has been our experience that due to specific process and controls in place with the current provider, GMP is often unable to deliver application enhancements to our customers in a timely manner. The revised project forecast allows for a shift in vendors and redeveloping of the application to move away from the proprietary code. In addition, to allow more control of changes, it is also important that the app design be consistent with current mobile app paradigms and with the rest of the GMP design on other web properties. The new vendor will develop the replacement application and provide knowledge transfer to internal GMP staff, allowing for updates and maintenance to be handled internally in the future. This will allow GMP staff to make updates to the application and handle app store deployments to the customer devices directly.
153629: 2018 Cust Self Service Enhance	Project Type: Computer Software In-Service Month: 9 In-Service Year: 2018 Primary Purpose: Customer Service Secondary Purpose: N/A Priority: Required Total Project Spending: $811,337	GMP has made available to customers a self-service portal for many years. This project is a set of enhancements to that self-service portal to keep it consistent with all other self-service channels offered by GMP. In order to continue to provide valuable customer self-service functions, the customer self-service (""My account"") portion of the GMP website must be continually enhanced and upgraded to incorporate the latest trends in website self-service features. This project will continue to deliver self-service features that will improve the customers overall experience with GMP, while reducing call volume, by giving the customer the tools necessary to make informed decisions surrounding their energy usage. In scope: Alerting and notifications - billing ready/payment due/past due, high energy alerts, pricing alerts, credit and collection alerts Notification center to manage alerts a customer may receive (outage alerts, billing alerts, account summary emails, etc.) Updates to usage system Start service/move in Rate comparison Manage recurring payments Increased logging and reporting of number of online profiles, login counts, time spent on site, etc.	The customer self-service site needs to be continually improved to keep pace with changing business and customer needs and demands, including self-service options, which have evolved dramatically and continue to increase in usage. As new programs are introduced, customers need to be able to manage them in a way that is convenient for them.
158840: 2018 Oracle Enterprise Sec Mod	Project Type: Computer Software In-Service Month: 9 In-Service Year: 2018 Primary Purpose: Safety Secondary Purpose: Regulatory Compliance Priority: Required Total Project Spending: $161,930	The scope of this project is to purchase and implement Oracle's Advanced Security licensing which is an add-on option to the Oracle database enterprise edition that will address privacy and regulatory requirements. Oracle Advanced Security provides data encryption and strong authentication services to the Oracle database, safeguarding sensitive data against unauthorized access from the network and the operating system. It also protects against theft, loss, and improper decommissioning of storage media and database backups. While the enterprise system we own is secure from hard-disk to application, Oracle's Advanced Security will ensure the highest level of security available in the industry for Oracle database rows and columns.	We store our customer's personal and sensitive data in some of our applications and it is necessary that we take precautions to ensure that their data is safe and secure. End point security is configured throughout the GMP environment and this software takes it further for us to now have the ability to encrypt specific columns and fields in some of our application databases to ensure further security around customer information. There are laws that require us to protect our customer's personal data and using transparent encryption is very good way to securely protect data at rest and in transit. With all of the recent breaches making headlines, our customers have an expectation that we do everything possible to keep their information secure.

Project Number and Title	Additional Information	Project Description	Project Justification
Computer Software - Rate Period (Jan. - Sept. 2019)			
159567: 19 Salesforce Partner Com Impl	Project Type: Computer Software In-Service Month: 1 In-Service Year: 2019 Primary Purpose: Innovation Secondary Purpose: Operational Efficiency Priority: Strategic Total Project Spending: $102,543	GMP has been expanding its customer facing energy programs for the past several years consistent with Vermont Act 56 legislation which requires utilities to offer fossil fuel saving programs direction to customers. To manage these new programs, the GMP Energy Services Team is currently using Salesforce (Customer Relationship Management application) as a key tool in their day-to-day operations. Salesforce is a software by service program that tracks all aspects of a customer which includes lead generation and prospect ranking. It has an outbound component to create and track marketing initiatives. Salesforce is different than Customer Care and Billing (CCB) as it tracks all characteristics of a customer and associated relationships (their home, community, current products, demographics, etc.) The scope of this project is to continue to evolve the Salesforce platform by implementing the Partner Community portal so we can promote collaboration between internal resources and Contractors (Partners), which will result in faster and more efficient processes. This new Partner Community Portal functionality will allow our Contractors (Partners) to: · View and edit their Contact/Account information and specializations · Have access to Customer Records and Jobs that have been assigned to them · Be able to view custom dashboards and reports to help organize their business with GMP · Consult the homepage to find news and relevant information specific to their Account · Create and view support Cases · View existing Assets · View product datasheets · Access Solutions to find relevant information about issues · Communicate via Chatter directly with internal Sales and Service teams	This Project is necessary at this time because the current process is manual and very inefficient. Today, there is one central resource coordinating all the products that need servicing. Despite the best reporting, this resource must filter the data, review the information generated, separate it out and disburse it via email to more than a dozen contractors. At times, the format is not easily used by our Contractors. We have seen them with multiple pages of paper taped together or spread out on a table so they can view all the necessary information. We have also had to print and scan the information to contractors who are unable to use Excel spreadsheets. Once the contractors complete the maintenance work, they email the necessary information and documentation back to the one GMP resource that must then input and attach the information to the cases in Salesforce. This work is very manual and labor intensive. With the implementation of Salesforce Partner Community Portal our Contractors will have the ability to view and perform self-service to the maintenance records that have been assigned to them so they can manage and complete the work in a timely manner. When the work is complete, the contractor can update the system and attach the necessary paperwork. This will free up the GMP staff, so they can spend time managing the process, and contractors, which will result in more value added work.
159576: 19 SCADA-AMI to OMS integr	Project Type: Computer Software In-Service Month: 5 In-Service Year: 2019 Primary Purpose: Operational Efficiency Secondary Purpose: Innovation Priority: Recommended Total Project Spending: $165,294	This project will deploy Schneider Electric's Responder Integration Framework (RXiF). The RXiF Framework will establish direct communication between our Supervisory Control and Data Acquisition Systems (SCADA) system used for monitoring and control of the electrical grid and our Responder Outage Management System (Responder OMS). This direct integration will allow for SCADA events such as breaker operations to be used as direct inputs into our outage management system, thus automating the outage management process from SCADA to OMS. This will also allow future integrations between our SCADA and OMS systems, and will help improve outage management, especially in busy storm situations.	The current outage management processes between SCADA and OMS rely on manual input from our System Operators who monitor the status of the electrical grid in the event of a SCADA-controlled device fault. The integration of the SCADA system directly with Responder OMS will automate this process, allowing for more efficient, accurate and timely outage management. It will also focus the operators on more value-added activities versus spending time manually managing these tasks.
159598: 19 Cust Usage Summary Notify	Project Type: Computer Software In-Service Month: 5 In-Service Year: 2019 Primary Purpose: Customer Service Secondary Purpose: N/A Priority: Recommended Total Project Spending: $216,039	This project is to bring the generation and delivery of weekly usage summary customer emails in house. The Weekly Summary Emails that are sent to customers include things such as the amount of KWh usage in the past week and an approximation of the cost; how much more or less was used from the previous week; and an approximation of the next bill amount based on projected usage and daily usage and dollar totals. Currently, the emails are generated and delivered by NRG and derived from data GMP is providing daily. The project will include work to compute things like bill-to-date charges, usage to date, week-over-week changes in electrical consumption, etc. in the GMP big data environment Hadoop. Batch jobs will then determine which customers are due for a notification, pull contacts from the contact database and construct and send the email.	The current service offered to GMP customers only includes our most basic electrical rates. Previous quotes by NRG to add a small number of additional rates have been provided with costs of around $200,000. This does not include the additional costs by GMP developers to pass the additional data to NRG to perform the additional calculations. Also, this project would be part of a larger effort to simplify and consolidate all of the various products and services that GMP currently utilizes for customer communications. A customer should be able to manage all of the various communications received from GMP in one spot in the customer self-service portal. This is currently not possible by having different vendors for each type of communication a customer receives. They must currently manage their preferences and contact methods with each of the vendors.
159588: 19 Pwr Supp Load-Peak Mgt tool	Project Type: Computer Software In-Service Month: 6 In-Service Year: 2019 Primary Purpose: Operational Efficiency Secondary Purpose: Innovation Priority: Strategic Total Project Spending: $317,177	GMP is committed to Vermont's goal of supplying 90% of Vermont's energy through renewable sources by 2050. This project helps advance this goal by building a tool and a data platform to monitor the distributed energy resources and correlate with ISO loads, GMP's generation, GMP customer load and Net-metering (generation) data. More specifically, this project involves developing a Load/Peak Management tool that provides a detailed understanding of our loads and resources by using datasets from multiple sources that are neither currently easily accessible nor linked. This will allow us to reconstitute GMP loads on an automated and timely basis to understand how our various resources are driving or helping to avoid costs for our customers. As part of this project we will build a resilient near real time data platform using data lake concepts. Datasets including but not limited to ISO-NE billing/settlement, VELCO standard offer settlement, Net Metering, MV90, Virtual Peaker, Tesla, Demand-Response curtailments, RNS&FCM peak data and AWIS weather data will be used. Data-engineering/modelling work to merge multiple data sources will be performed using industry leading tools like Talend. Hadoop will be used as a data-store. Tableau will be used for visualization and act as a graphical user interface.	This is especially critical at this time as we try to understand the impact of our large installed solar base, the planned addition of battery storage over the next several years, and the rapid growth of controllable devices through various programs. To the extent that these resources are generating or otherwise participating (e.g. charging or discharging in the case of battery storage) in the market during specific hours, they will impact GMP's total loads and directly affect energy costs. They may also be moving cost allocations for products such as transmission ("RNS") and Capacity ("FCM"), which will have a more significant impact on GMP's power supply costs. Understanding how these resources shift the timing of peak loads and potentially flatten the load curve will be critical as we try to manage costs for our customers and plan our portfolio to ensure that we meet customer demand and state renewable energy goals.

Project Number and Title	Additional Information	Project Description	Project Justification
159600: 19 GMP Web Site Refresh	Project Type: Computer Software In-Service Month: 7 In-Service Year: 2019 Primary Purpose: Customer Service Secondary Purpose: Operational Efficiency Priority: Recommended Total Project Spending: $400,689	The purpose of this project is to upgrade and enhance the User Interface (UI), User Experience (UX), functionality, and compatibility of the Green Mountain Power website. The scope of work will include: • Developing new features that will enhance the user experience. • Simplifying the UI/UX of the site to make it more user-friendly and consistent. • Updating and improving the content management platform from which the web site is served. • Integrating account authentication and improved security across the site. • Add eCommerce and improved payment capabilities. • Continue to improve outage and safety information. • Improving and enhancing the web site's admin tools to allow for easier updates and maintenance of the website. • Refreshing design elements to account for changes in browser and mobile compatibility, as well as to present new content.	It is important to regularly improve and enhance the Company's web site to keep current with changes in technology, security, and programming, as well as to simplify the customer user experience by making information and resources available in a more seamless and useful way. Web, browser, and programming technology is consistently changing, as are the Company's programs and customer focus. It is important that we keep the website's functionality, utility and compatibility on the leading edge in order to meet and exceed our customers' expectations and needs and maintain high levels of customer satisfaction. Meeting customers' needs on line also helps drive customers to self-service functions, reducing demand on the call center.
159583: 19 Customer Alert & Comm Sys	Project Type: Computer Software In-Service Month: 9 In-Service Year: 2019 Primary Purpose: Customer Service Secondary Purpose: N/A Priority: Recommended Total Project Spending: $208,754	GMP currently supports SMS text messaging for outage reporting and checking outage status as well as one-way SMS text and email notifications for outage alerts, but the system was developed and is owned by KUBRA, formerly iFactor. This project will bring all SMS text and email messaging for outage reporting and notification in house, as well as expanding offerings to include other notices such as bill reminders and usage alerts. Also included in the scope of this project is a web-based dashboard to view message history, analytics, sending of ad-hoc broadcast messages, contact management, etc. Customers will be able to opt in to receive various types of alerts for their GMP accounts and manage the contacts (mobile phone, email) that they wish to receive the alerts. For example a customer may elect to only receive outage notifications but not bill alerts, or they may elect to receive both alert types, but receive bill notifications as an email and outage reports as SMS texts. As new power outages occur on the GMP network, customers who have opted into the system will receive an SMS text message alerting them that their power may be out. As information, such as an estimated time of restoration, is entered into the system, customers may receive additional alerts. Customers will be able to perform two-way messaging by texting that they are out of power and report a power outage. For bill-due notifications, a process will identify customers who will have a bill due soon. An email and/or SMS text message will be sent to those customers who have opted in.	By GMP bringing customer messaging in house, it will allow for more types of alerts to be added over time without a customer having to register for different types of services due to different vendors owning the process behind the scenes. For example, if KUBRA owns our outage reporting messaging but our bill vendor owns sending bill due notifications, it becomes confusing for the customer when they need to manage these types of notifications in different places. This will resolve that issue and simplify the notification enrollment process for customers.
159553: 19 M2C Enhancements	Project Type: Computer Software In-Service Month: 9 In-Service Year: 2019 Primary Purpose: Customer Service Secondary Purpose: Regulatory Compliance Priority: Required Total Project Spending: $384,290	The scope of this project is to undertake multiple enhancements that will add new features and functionality to Oracle Utilities M2C (Meter-to-Cash) solution which consists of Customer Care & Billing (CCB), Meter Data Management (MDM), Mobile Workforce Management (MWM) and Operational Device Management (ODM). Due to the evolving statutory and regulatory requirements in Vermont, it is necessary for GMP to add certain customized capabilities to its Meter-to-Cash applications. By adding new features and functionality GMP can remain in compliance with Vermont requirements in an efficient manner as well as gaining operational efficiencies. Enhancements that have been identified include: Group Setup Automation, Group Billing Automations, Automation of Premise Setup, Automation of Tax Exemption Process, Customer Pre-Pay, Enhance Payment Arrangement Functionality, Streamlining of MDM usage groups, Net Meter Regulatory Changes, Energy Transformation initiatives, Credit & Collections for Group Net Metering, Solar Meter Install Process efficiencies, Rates changes driven by rate case, systems changes and enhancements driven by regulatory changes, business process efficiency changes, and efficiency innovation customer offerings. The majority of the work will be done with external resources.	The continued evolution of these Oracle Utilities applications is necessary to provide better customer service, comply with regulatory-driven requirements, and operate as efficiently as possible.

Project Number and Title	Additional Information	Project Description	Project Justification
159555: 19 Meter to Rev Mmgt Rpt Tool	Project Type: Computer Software In-Service Month: 9 In-Service Year: 2019 Primary Purpose: Operational Efficiency Secondary Purpose: Reliability Priority: Required Total Project Spending: $671,835	Meters are a very important component of GMP's system and are the mechanism through which customer usage is determined. Failure of these devices to function properly can have significant consequences for customer service and experience, as well as for GMP's financial performance. This project helps to improve the Meter to Billing process to ensure accurate meeting reading and billing. Our goal is to build a Meter to Revenue management tool (MET2REV) that will continuously monitor for signature patterns that indicate defective or improperly configured meters. 24/7 screening yields prioritized lists of meters for field investigation or replacement before the issues can impact operations or billing. By relying on this monitoring to protect against lost or inaccurate data, GMP will be able to reduce meter operations costs while improving billing accuracy for customers. We will use Cross Industry Standard Process for Data Mining (CRISP-DM)+Agile methodology. CRISP-DM+Agile methodology allows us to rapidly prototype a baseline solution framework to surface any technical and interface issues. Then, the complete system is strengthened by iteratively improving components - often in parallel. This allows the path-critical components to be discovered and improved as time and budget allow, and provides decision-makers with better estimates of the tradeoffs involved. The following are planned to be completed as part of this project: Data Platform and Modeling: Integrated dataset from multiple systems like Customer service and Billing, Meter data management, AMI infrastructure, GIS, Weather data, SCADA, MV90. Meter and Billing operations: Timely detection of meter malfunctions and improper configurations, so customers will not be billed with bad data. Revenue Protection: Analytics that identify meter tampering and service bypass conditions, enabling GMP to protect their investments in a cost-effective manner. Meter data Exploration tool: Intuitive user interface to access results and perform data discovery on meter population. This analytics platform will reconcile transformer-level data and smart meter data to monitor device performance and preemptively determine overload and predict failures. Grid Efficiencies: We will be working closely with GMP Engineers to produce value-added, circuit-level data analytics like detecting high-low voltages and Phase validation.	GMP has invested in smart-grid infrastructure over several years. Optimization of meter-to-bill processes is a crucial challenge for GMP. We must be able to quickly resolve any issues that arise between the service point and the bill, but given the complexities inherent to any utility's meter-to-bill processes, identifying inconsistent billing data and the associated meter malfunctions isn't always straightforward. This is especially critical at this time as the tools that we relied on for the past few years have proven to be expensive, does not provide timely information, is not always as accurate as desired, and has been difficult to adapt to GMP's changing business model.
159569: 19 Net Metering-DER Database	Project Type: Computer Software In-Service Month: 9 In-Service Year: 2019 Primary Purpose: Customer Service Secondary Purpose: Operational Efficiency Priority: Recommended Total Project Spending: $62,201	This project will rebuild an existing application used by solar installers for submitting applications for distributed energy projects and internal users for the management and updating of these applications. New features as requested by the businesses will be added, and will provide a much simpler user experience that is in line with the current GMP design and user expectations.	As GMP continues to support additional distributed energy projects, a flexible, easy-to-use, easy-to-maintain app with a consistent user experience is needed. In addition to overall system enhancements, developing this system on a platform that can be supported by internal GMP staff will lower the overall cost of the application and future support. The existing application is built using a complex Oracle framework. GMP does not have the staff with the necessary skillset in-house to support it. Enhancements to the existing product would require contract labor on an ongoing basis.
Property & Structures - Interim Period (Oct. 2017 - Dec. 2018)			
148723: St J Storage Building	Project Type: Property & Structures In-Service Month: 10 In-Service Year: 2017 Primary Purpose: Safety Secondary Purpose: Operational Efficiency Priority: Recommended Total Project Spending: $235,606	This project consists of the construction of a fully enclosed, unheated, standalone building (approximately 30'x60') for the storage of wire reel trailers, construction equipment, tracked vehicles and materials that become difficult to access and use in a timely fashion when stored outside during inclement weather months and are essential for both routine work and service restoration. This project was completed in October 2017.	The St Johnsbury district has a number of trailers, utility vehicles, and materials that are currently stored outside and unprotected from the elements. Our field employees in the St. Johnsbury district, primarily lineworkers and substation workers are called upon to work not only during busy day-to-day operations, but also at all hours of the day and night during service restoration, whether during a storm or individual restoration events during the week. While we believe it is reasonable for some amount of equipment to be stored outside, such as large transformers, we strive to keep most of our everyday equipment that is of upmost importance in restoration and day to day operations indoors, such as bucket trucks, digger trucks and off-road equipment. Keeping materials and equipment under cover and out of the inclement Vermont weather allows us to work quickly and efficiently during both daily operations and emergency storm restoration. It ensures our equipment is ready to go when we need it, all hours of the day and night. It also allows us to get the most out of this important equipment, limiting equipment down time and maintenance.
148966: EMAC Fire Alarm	Project Type: Property & Structures In-Service Month: 1 In-Service Year: 2018 Primary Purpose: Safety Secondary Purpose: Regulatory Compliance Priority: Required Total Project Spending: $20,523	This project is for the installation of a new fire alarm system at our Electrical Maintenance Facility. This project was completed in January 2018. The system was designed in accordance with NFPA standards and obtained the required permit from the Department of Fire and Safety. The system included installing 7 duct detectors in the heating and ventilation system, 43 heat sensors, 15 audio/visual devices and 13 pull stations throughout the facility.	This fire alarm system is over 20 years old. The unit is no longer manufactured and any replacement parts are difficult to find or no longer manufactured. The fire alarm panel is critical to the safety of the employees, visitors, and equipment at the facility.
143541: Purchase Land in Websterville	Project Type: Property & Structures In-Service Month: 10 In-Service Year: 2017 Primary Purpose: Reliability Secondary Purpose: Customer Service Priority: Required Total Project Spending: $141,901	This project consists of purchasing approximately four acres at the Websterville Substation to support the reconstruction and expansion of the substation to ensure the reliability of our electrical system. This project (land purchase) has been completed.	The expansion of our Websterville Substation requires the purchase of additional land to accommodate the expansion and ensure the reliability of our electrical system.

Project Number and Title	Additional Information	Project Description	Project Justification
148732: 2017 Blanket	Project Type: Property & Structures In-Service Month: 11 In-Service Year: 2017 Primary Purpose: Operational Efficiency Secondary Purpose: Safety Priority: Recommended Total Project Spending: $468,024	This project consists of the facilities "blanket" purchases, which are purchases throughout 2017 of miscellaneous furniture, racking, shelving and equipment that need to be replaced or repaired due to breakdowns or failures. The project cost of $468,024 is based on the actual, already completed spending for the 2017 blanket. The five-year historical average of facilities “blanket” purchases and represents the expected cost for 2017 items, which was $196,138. However, during 2017, in addition to the average number of miscellaneous repairs and replacements, we had two large emergency replacements of generators at the St. Albans and Springfield facilities, which were significant expenses.	This project ensures all facilities throughout the state remain fully functional and effective throughout the year. Each year we have a number of items break down or fail and we must replace this equipment to remain operational. These failures are typically a hot water heater, garage door operator, ice machine, collapsed floor or sewer drain, and circ pump. Keeping this equipment running is critical to the mechanical systems within the facility.
148806: Purchase Land in W.R.	Project Type: Property & Structures In-Service Month: 11 In-Service Year: 2017 Primary Purpose: Reliability Secondary Purpose: Customer Service Priority: Strategic Total Project Spending: $102,477	This project is for the purchase of 0.5 acres of property located at 183 Barnes Street in West Rutland adjacent to our existing substation. This project (land purchase) has been completed.	The purchase of additional land is necessary to accommodate the expansion of the West Rutland Substation to ensure the reliability of our electrical system and improve customer service.
148733: 2018 Facility Blanket	Project Type: Property & Structures In-Service Month: 10 In-Service Year: 2018 Primary Purpose: Operational Efficiency Secondary Purpose: Safety Priority: Recommended Total Project Spending: $254,493	This project consists of the facilities "blanket" purchases, which are purchases throughout 2018 of miscellaneous furniture, racking, shelving and equipment that need to be replaced or repaired due to breakdowns or failures.	This project ensures all facilities throughout the state remain fully functional and effective throughout the year. Each year we have a number of items break down or fail and we must replace this equipment to remain operational. These failures are typically a hot water heater, garage door operator, ice machine, collapsed floor or sewer drain, and circ pump. Keeping this equipment running is critical to the mechanical systems within the facility.
148727: Sunderland Unit Heaters	Project Type: Property & Structures In-Service Month: 10 In-Service Year: 2018 Primary Purpose: Safety Secondary Purpose: Operational Efficiency Priority: Recommended Total Project Spending: $23,688	To replace 4 gas unit heaters at the Sunderland Service Center. We will be replacing the existing units with infrared tube heaters that will utilize the existing penetrations, electrical, heating controls and piping.	The unit heaters that serve the warehouse areas at the Sunderland Service Center are over 20 years old and have begun to fail. We have had heat exchanger failures. When the heat exchangers fail it creates an unsafe level of carbon monoxide. The unit heaters have a life expectancy of approximately 15 years. These units have surpassed their life expectancy and need to be replaced.
148726: Royalton Unit Heaters	Project Type: Property & Structures In-Service Month: 11 In-Service Year: 2018 Primary Purpose: Safety Secondary Purpose: Operational Efficiency Priority: Recommended Total Project Spending: $39,987	To replace 7 gas unit heaters in the Royalton Service Center. We will be replacing the existing units with infrared tube heaters that will utilize the existing penetrations, electrical, heating controls and piping.	The unit heaters that serve the warehouse areas at the Royalton service center are over 20 years old and have begun to fail. We have had heat exchanger failures. When the heat exchangers fail, it creates an unsafe level of carbon monoxide. The unit heaters have a life expectancy of approximately 15 years. These units have surpassed their life expectancy and need to be replaced.

Project Number and Title	Additional Information	Project Description	Project Justification
Transportation - Interim Period (Oct. 2017 - Dec. 2018)			
153768: 2018 Utility Vehicle Rep	Project Type: Transportation In-Service Month: 3 In-Service Year: 2018 Primary Purpose: Operational Efficiency Secondary Purpose: Reliability Priority: Recommended Total Project Spending: $15,454	This project is for the purchase of two Honda Rubicon 500cc all-terrain vehicles ("ATV"). One unit is a replacement off road vehicle for transmission and distribution operations in our Rutland District. The other is a new unit for power production operations in our Middlebury District. In Rutland, we are replacing a Bombardier ATV that is 13 years old and in poor condition. Our Rutland district is one of the largest districts in the state and serves approximately 27,000 customers. In many places in the Rutland district, our transmission and distribution lineworkers perform construction and maintenance on lines that are located way off the road in rough terrain. Off road equipment is necessary in order to conduct the work and ensure we are providing safe and reliable power to our customers during daily operations and storm restoration events. Additionally, our Middlebury District for power production operations is one the largest in the state, both in number of generating units and geographic area. Many of the generating facilities are located in remote and hard to get to areas. In addition, the generating units have emergency action plans that require quick and efficient access during or in preparation for emergency situations. Similar to our transmission and distribution team, this off road vehicle will ensure our power production team can access generating facilities located way off the road in rough terrain and ensure we continue to generate safe and reliable power. This project was completed in March 2018.	The existing ATV in the Rutland District is 13 years old and in poor condition. Replacing critical off road vehicles ensures we can adequately serve our customers, whether in storm restoration, emergencies or day-to-day operations. It also ensures our employees are operating safe and reliable vehicles and equipment. In many places in the Rutland district, our transmission and distribution lineworkers perform construction and maintenance on lines that are located way off the road in rough terrain. In this case, off road equipment is necessary in order to conduct the work and ensure we are providing safe and reliable power to our customers. The additional unit in Middlebury was required to allow for a 2 person crew to perform routine maintenance as well as monitor generation sites during varying weather conditions safely.
156446: 2017 ARGO Bratt	Project Type: Transportation In-Service Month: 3 In-Service Year: 2018 Primary Purpose: Operational Efficiency Secondary Purpose: Reliability Priority: Required Total Project Spending: $62,035	This project is for the purchase of an ARGO all-terrain vehicle ("ATV") and associated trailer for GMP's transmission and distribution operations in our Brattleboro District.	The existing UTV in the Brattleboro District is approximately 10 years old and in poor condition. Replacing critical off road vehicles ensures we can adequately serve our customers, whether in storm restoration, emergencies or day-to-day operations. It also ensures our employees are operating safe and reliable vehicles and equipment. In many places in the Brattleboro district, our transmission and distribution lineworkers perform construction and maintenance on lines that are located way off the road in rough terrain. In this case, off road equipment is necessary in order to conduct the work and ensure we are providing safe and reliable power to our customers.
153774: 2018 Small Vehicles	Project Type: Transportation In-Service Month: 6 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Required Total Project Spending: $302,589	This project is the completion of the 2018 small vehicle replacements. The remaining purchases are the truck bodies and equipment for 4 Ford pickups utilized by our electrical relay team, 1 for our electrical maintenance team, and 1 for our vehicles team the welder and generator. Each unit is a replacement for a prior unit that was in extremely poor condition and no long safe or reliable for operation. The truck bodies were the last piece to be delivered due to longer lead times than the Ford chassis.	Our small vehicles are used by our field personnel to read meters, design construction jobs, support service restoration and construct and maintain substations. These particular truck bodies will be utilized by our relay operations team, our substation electrical maintenance team and our vehicle maintenance team. Aging vehicles require frequent repair due to their day to day use. We have experienced engine failures in aging Ford F450 and F550 units with the total cost of the replacement in excess of $15,000 per unit. Many of the smaller units being replaced will no longer pass state inspection criteria and we estimated that bringing these units up to inspection standards could cost approximately $3,000 to $5,000 per unit to complete, and would only minimally extend the life of the vehicle due to other mechanical factors such as corrosion and rot to engine components and drive lines.
153766: 2018 Track Digger Rep	Project Type: Transportation In-Service Month: 7 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Operational Efficiency Priority: Required Total Project Spending: $508,499	The project is for the purchase of a track digger vehicle to replace an aged tracked digger derrick vehicle in our fleet. This tracked digger vehicle is 18 years old and in poor physical condition. Replacing this critical vehicle ensures we can adequately serve our customers, whether in storm restoration, emergencies or day-to-day operations. It also ensures our employees are operating safe and reliable vehicles and equipment. We are replacing a 2001 track digger vehicle due to age and failures we have experienced, such as cracks in boom weldments and hydraulic hose failures due to corrosion and rot throughout the equipment.	Our transmission and distribution lineworkers often perform construction and maintenance on lines that are located way off the road in rough Vermont terrain. In this case, off road equipment is necessary in order to conduct the work and ensure we are providing safe and reliable power to our customers during daily operations and storm restoration events. This project will replace the only tracked digger derrick vehicle in our fleet capable of transmission and large distribution construction, which has been used for 18 years in extreme off road conditions and is in poor condition. With this replacement, GMP will maintain its ability to set large poles in rights of way and other critical transmission and distribution work to ensure we can adequately serve our customers, whether in storm restoration, emergencies or day-to-day operations.
153764: 2018 Bucket 20306 Replacements	Project Type: Transportation In-Service Month: 10 In-Service Year: 2018 Primary Purpose: Safety Secondary Purpose: Reliability Priority: Required Total Project Spending: $329,563	This project is to replace 1 bucket truck in our Colchester District that is 12 years old and has reached the end of its useful life.	The 2006 bucket truck being replaced is over a decade old and is in poor physical condition with almost 150,000 miles on it. This truck has been used extensively over the last 12 years and has approximately 16,000 engine hours. This unit has reached the end of its useful life and must be replaced. Replacing this critical vehicle ensures we can adequately serve our customers, whether in storm restoration, emergencies or day-to-day operations. It also ensures our employees are operating safe and reliable vehicles and equipment.
153765: 2018 Digger Replacements	Project Type: Transportation In-Service Month: 10 In-Service Year: 2018 Primary Purpose: Safety Secondary Purpose: Reliability Priority: Required Total Project Spending: $366,578	This project is to replace 1 digger derrick truck that is over ten years old and has reached the end of its useful life.	The 2007 digger truck being replaced is over a decade old and is in poor physical condition with almost 98,000 miles on it. This truck has been used extensively over the last 10 years and has approximately 9,461 engine hours. This unit has reached the end of its useful life and must be replaced. Replacing this critical vehicle ensures we can adequately serve our customers, whether in storm restoration, emergencies or day-to-day operations. It also ensures our employees are operating safe and reliable vehicles and equipment.
160396: 2018 Bucket 290 Rep	Project Type: Transportation In-Service Month: 10 In-Service Year: 2018 Primary Purpose: Safety Secondary Purpose: Reliability Total Project Spending: $318,390	This project is to replace 1 bucket truck in our Middlebury District that is 12 years old and has reached the end of its useful life.	The 2006 bucket truck being replaced is over a decade old and is in poor physical condition with almost 145,000 miles on it. This truck has been used extensively over the last 12 years and has approximately 12,300 engine hours. This unit has reached the end of its useful life and must be replaced. Replacing this critical vehicle ensures we can adequately serve our customers, whether in storm restoration, emergencies or day-to-day operations. It also ensures our employees are operating safe and reliable vehicles and equipment.
160397: 2018 Bucket 904 Rep	Project Type: Transportation In-Service Month: 10 In-Service Year: 2018 Primary Purpose: Safety Secondary Purpose: Reliability Total Project Spending: $321,101	This project is to replace 1 bucket truck in our St. Johnsbury District that is 12 years old and has reached the end of its useful life.	The 2006 bucket truck being replaced is over a decade old and is in poor physical condition with almost 150,000 miles on it. This truck has been used extensively over the last 12 years and has approximately 16,000 engine hours. This unit has reached the end of its useful life and must be replaced. Replacing this critical vehicle ensures we can adequately serve our customers, whether in storm restoration, emergencies or day-to-day operations. It also ensures our employees are operating safe and reliable vehicles and equipment.

Project Number and Title	Additional Information	Project Description	Project Justification
160398: 2018 Bucket 906 Rep	Project Type: Transportation In-Service Month: 10 In-Service Year: 2018 Primary Purpose: Safety Secondary Purpose: Reliability Total Project Spending: $316,078	This project is to replace 1 bucket truck in our Springfield District that is 11 years old and has reached the end of its useful life.	The 2007 bucket truck being replaced is over a decade old and is in poor physical condition with almost 169,000 miles on it. This truck has been used extensively over the last 11 years and has approximately 13,000 engine hours. This unit has reached the end of its useful life and must be replaced. Replacing this critical vehicle ensures we can adequately serve our customers, whether in storm restoration, emergencies or day-to-day operations. It also ensures our employees are operating safe and reliable vehicles and equipment.
160399: 2018 Bucket 907 Rep	Project Type: Transportation In-Service Month: 10 In-Service Year: 2018 Primary Purpose: Safety Secondary Purpose: Reliability Total Project Spending: $321,460	This project is to replace 1 bucket truck in our Rutland District that is 11 years old and has reached the end of its useful life.	The 2007 bucket truck being replaced is over a decade old and is in poor physical condition with almost 134,000 miles on it. This truck has been used extensively over the last 11 years and has approximately 13,000 engine hours. This unit has reached the end of its useful life and must be replaced. Replacing this critical vehicle ensures we can adequately serve our customers, whether in storm restoration, emergencies or day-to-day operations. It also ensures our employees are operating safe and reliable vehicles and equipment.
160400: 2018 Bucket 910 Rep	Project Type: Transportation In-Service Month: 10 In-Service Year: 2018 Primary Purpose: Safety Secondary Purpose: Reliability Total Project Spending: $318,390	This project is to replace 1 bucket truck in our Royalton District that is 11 years old and has reached the end of its useful life.	The 2007 bucket truck being replaced is over a decade old and is in poor physical condition with almost 184,000 miles on it. This truck has been used extensively over the last 11 years and has approximately 13,000 engine hours. This unit has reached the end of its useful life and must be replaced. Replacing this critical vehicle ensures we can adequately serve our customers, whether in storm restoration, emergencies or day-to-day operations. It also ensures our employees are operating safe and reliable vehicles and equipment.
160401: 2018 Bucket 946 Rep	Project Type: Transportation In-Service Month: 10 In-Service Year: 2018 Primary Purpose: Safety Secondary Purpose: Reliability Total Project Spending: $313,368	This project is to replace 1 bucket truck in our Sunderland District that is 10 years old and has reached the end of its useful life.	The 2008 bucket truck being replaced is over a decade old and is in poor physical condition with almost 106,000 miles on it. This truck has been used extensively over the last 10 years and has approximately 7,000 engine hours. This unit has reached the end of its useful life and must be replaced. Replacing this critical vehicle ensures we can adequately serve our customers, whether in storm restoration, emergencies or day-to-day operations. It also ensures our employees are operating safe and reliable vehicles and equipment.
160402: 2018 Bucket 950 Rep	Project Type: Transportation In-Service Month: 10 In-Service Year: 2018 Primary Purpose: Safety Secondary Purpose: Reliability Total Project Spending: $320,350	This project is to replace 1 bucket truck in our St. Albans District that is 10 years old and has reached the end of its useful life.	The 2008 bucket truck being replaced is a decade old and is in poor physical condition with almost 130,000 miles on it. This truck has been used extensively over the last 10 years and has approximately 8,000 engine hours. This unit has reached the end of its useful life and must be replaced. Replacing this critical vehicle ensures we can adequately serve our customers, whether in storm restoration, emergencies or day-to-day operations. It also ensures our employees are operating safe and reliable vehicles and equipment.
160403: 2018 Bucket 25404 Rep	Project Type: Transportation In-Service Month: 10 In-Service Year: 2018 Primary Purpose: Safety Secondary Purpose: Reliability Total Project Spending: $323,061	This project is to replace 1 bucket truck in our Colchester District that is 14 years old and has reached the end of its useful life.	The 2004 bucket truck being replaced is over a decade old and is in poor physical condition with almost 170,000 miles on it. This truck has been used extensively over the last 14 years and has approximately 18,000 engine hours. This unit has reached the end of its useful life and must be replaced. Replacing this critical vehicle ensures we can adequately serve our customers, whether in storm restoration, emergencies or day-to-day operations. It also ensures our employees are operating safe and reliable vehicles and equipment.
160420: 2018 EMAC Tanker Chassis	Project Type: Transportation In-Service Month: 10 In-Service Year: 2018 Primary Purpose: Safety Secondary Purpose: Reliability Total Project Spending: $68,819	This project is to replace the 1987 chassis of our oil tanker truck utilized by our electrical maintenance crews. The tanker unit itself is in good condition and will be kept and reinstalled on the replacement chassis. This is a tanker truck used in our substations to replace the oil in large, critical transformers. The existing chassis is in poor condition and has been used extensively over the last 31 years and has substantial rot and corrosion. Our vehicles and equipment are critical components of storm restoration, emergencies and day-to-day operations of our business. They must be safe, effective and reliable. This ensures our employees are operating safe equipment and that we can adequately serve our customers, whether in storm restoration, emergencies or day-to-day operations.	This chassis has reached the end of its useful life and must be replaced due to increased issues with reliability and the lack of parts available due to its age and model. This vehicle is used primarily to maintain our large substation transformers as well as respond to unplanned outages and service restoration when we have a failure. The last time the truck required repair it was out of service for over a month as parts could not be located. This delay in repair limited our ability to perform substation maintenance on the transformer and increased our exposure to responding to a substation transformer failure.
160449: 2018 UTV Tracked Unit	Project Type: Transportation In-Service Month: 5 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Operational Efficiency Total Project Spending: $318,119	The project is for the purchase of a tracked utility task vehicle ("UTV") and associated trailer. This unit will be utilized by our Sunderland and Springfield transmission and distribution crews. Our transmission and distribution lineworkers often perform construction and maintenance on lines that are located way off the road in rough Vermont terrain. In this case, off road equipment is necessary in order to conduct the work and ensure we are providing safe and reliable power to our customers during daily operations and storm restoration events.	The availability of critical off road vehicles ensures we can adequately serve our customers, whether in storm restoration, emergencies or day-to-day operations. It also ensures our employees are operating safe and reliable vehicles and equipment. In many places in the Sunderland and Springfield district, our transmission and distribution lineworkers perform construction and maintenance on lines that are located way off the road in rough terrain. In this case, off road equipment is necessary in order to conduct the work and ensure we are providing safe and reliable power to our customers. In recent years, we have added these units to districts with particularly rugged terrain and they have proven invaluable to our service restoration and construction efforts.
Transportation - Rate Period (Jan. - Sept. 2019)			
159633: 2019 Small Vehicle Replacements	Project Type: Transportation In-Service Month: 7 In-Service Year: 2019 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Strategic Total Project Spending: $570,084	This purchase is for the replacement of 15 small vehicles in GMP's fleet. These vehicles include 2 Ford Escapes, 8 Ford F-150s, 1 Toyota Rav4, 3 Ford F250s, and 1 Ford F450 (including the truck body). All of these purchases are replacements for existing small vehicles that are in extremely poor condition and no long safe or reliable for operation. These vehicles range in age from 2005 to 2011.	Our small vehicles are used by our field personnel to read meters, design construction jobs, support service restoration and construct and maintain substations. Aging vehicles require frequent repair due to their day to day use. We have experienced engine failures in aging Ford F450 and F550 units with the total cost of the replacement in excess of $15,000 per unit. Many of the smaller units being replaced will no longer pass state inspection criteria and we estimated that bringing these units up to inspection standards could cost approximately $3,000 to $5,000 per unit to complete, and would only minimally extend the life of the vehicle due to other mechanical factors such as corrosion and rot to engine components and drive lines.

Project Number and Title	Additional Information	Project Description	Project Justification
159634: 2019 Bucket 23409 Rep	Project Type: Transportation In-Service Month: 9 In-Service Year: 2019 Primary Purpose: Safety Secondary Purpose: Reliability Priority: Strategic Total Project Spending: $323,500	This project is to replace 1 bucket truck in our Colchester District that is 10 years old and has reached the end of its useful life.	The 2009 bucket truck being replaced is a decade old and is in poor physical condition with almost 150,000 miles on it. This truck has been used extensively over the last 10 years and has approximately 9,700 engine hours. This unit has reached the end of its useful life and must be replaced. Replacing this critical vehicle ensures we can adequately serve our customers, whether in storm restoration, emergencies or day-to-day operations. It also ensures our employees are operating safe and reliable vehicles and equipment.
159635: 2019 Digger Trucks	Project Type: Transportation In-Service Month: 9 In-Service Year: 2019 Primary Purpose: Safety Secondary Purpose: Reliability Priority: Strategic Total Project Spending: $366,592	This project is to replace 1 digger derrick truck that is over ten years old and has reached the end of its useful life.	The 2007 digger truck being replaced is over a decade old and is in poor physical condition with almost 90,000 miles on it. This truck has been used extensively over the last 10 years and has approximately 8,500 engine hours. This unit has reached the end of its useful life and must be replaced. Replacing this critical vehicle ensures we can adequately serve our customers, whether in storm restoration, emergencies or day-to-day operations. It also ensures our employees are operating safe and reliable vehicles and equipment.
160404: 2019 Bucket 909 Rep	Project Type: Transportation In-Service Month: 9 In-Service Year: 2019 Primary Purpose: Safety Secondary Purpose: Reliability Total Project Spending: $318,819	This project is to replace 1 bucket truck in our Sunderland District that is 12 years old and has reached the end of its useful life.	The 2007 bucket truck being replaced is a decade old and is in poor physical condition with almost 194,000 miles on it. This truck has been used extensively over the last 12 years and has approximately 13,800 engine hours. This unit has reached the end of its useful life and must be replaced. Replacing this critical vehicle ensures we can adequately serve our customers, whether in storm restoration, emergencies or day-to-day operations. It also ensures our employees are operating safe and reliable vehicles and equipment.
160405: 2019 Bucket 725 Rep	Project Type: Transportation In-Service Month: 9 In-Service Year: 2019 Primary Purpose: Safety Secondary Purpose: Reliability Total Project Spending: $316,517	This project is to replace 1 bucket truck in our Springfield District that is 10 years old and has reached the end of its useful life.	The 2009 bucket truck being replaced is a decade old and is in poor physical condition with almost 168,000 miles on it. This truck has been used extensively over the last 10 years and has approximately 11,500 engine hours. This unit has reached the end of its useful life and must be replaced. Replacing this critical vehicle ensures we can adequately serve our customers, whether in storm restoration, emergencies or day-to-day operations. It also ensures our employees are operating safe and reliable vehicles and equipment.
160406: 2019 Bucket 742 Rep	Project Type: Transportation In-Service Month: 9 In-Service Year: 2019 Primary Purpose: Safety Secondary Purpose: Reliability Total Project Spending: $318,819	This project is to replace 1 bucket truck in our Royalton District that is 10 years old and has reached the end of its useful life.	The 2009 bucket truck being replaced is a decade old and is in poor physical condition with almost 179,000 miles on it. This truck has been used extensively over the last 10 years and has approximately 12,000 engine hours. This unit has reached the end of its useful life and must be replaced. Replacing this critical vehicle ensures we can adequately serve our customers, whether in storm restoration, emergencies or day-to-day operations. It also ensures our employees are operating safe and reliable vehicles and equipment.