Project Number and Title	Additional Information	Project Description	Project Justification
Distribution Lines - Interim Period (Oct. 2017 - Dec. 2018)			
127407: Chester Line 313	Project Type: Distribution Lines In-Service Month: 3 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Operational Efficiency Priority: Strategic Total Project Spending: $319,062	This project is a rebuild and reconductoring of Chester line 313, poles 99 to 118, and Chester line 3134, poles 1 to 9. As part of the rebuild and reconductoring, the line will be moved from its existing off-road corridor to the road.	The primary purpose of this project is to update and replace aged and highly deteriorated facilities and bring some of the pole plant that is currently off-road to the road to improve reliability, worker access and safety of employees. Existing facilities have an average pole age of 55 years. The bare wire on this line has seen excessive damage from storms and tree contact. Many wire splices are present. Adding a covered wire and bringing poles to the road will significantly improve the reliability of this line while speeding repairs that do occur, and reducing risk to employees working on cross-country assets.
147517: Athens L3 P502-542,P502-L301 P7	Project Type: Distribution Lines In-Service Month: 3 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Operational Efficiency Priority: Strategic Total Project Spending: $863,600	This project is a rebuild and reconductoring of Athens line 3 poles 502-543 and Athens line 301 poles in Athens. As part of the rebuild and reconductoring, the line will be moved from its existing off-road corridor to the road.	The primary purpose of this project is to update and replace aged and highly deteriorated facilities and bring some of the pole plant that is currently off-road to the road. Existing facilities have an average pole age of 70 years. The bare #4 stranded copper wire on this line has seen excessive damage from storms and tree contact. Many wire splices are present. Patrolling and restoring the line during outage events is challenging with potential natural hazards and is very time consuming in this very rural area. This area has not seen any upgrades preventative maintenance to existing facilities for a very long period Adding a covered wire and bringing poles to the road will significantly improve the reliability of this line, and the roadside location will help reduce the risks to field workers.
153950: Line 74 - Section II	Project Type: Distribution Lines In-Service Month: 4 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Operational Efficiency Priority: Strategic Total Project Spending: $1,181,985	This project is a rebuild and relocation of single-phase off-road line to the Lincoln-Ripton Road.	The primary purpose of this project is to update and replace aged and highly deteriorating facilities and bring some of the pole plant that is currently off-road to the road. Existing facilities have an average pole age of 45 years and are spread across a very rural area prone to extreme weather. The bare wire on this line has seen excessive damage from storms and tree contact. Many wire splices are present. Adding a covered wire and bringing poles to the road will help storm-harden this area and will significantly improve reliability of this line for customers. Additionally, this line is part of the HR-G38 circuit. This circuit is on GMP's worst circuits list. This project is an effort to storm-harden the entire line 7 and the HR-38 circuit in conjunction with other projects on this circuit. With these efforts, we can achieve greater reliability to the Lincoln and Starksboro area.
157361: Westminster Rt5 - Hendrix	Project Type: Distribution Lines In-Service Month: 4 In-Service Year: 2018 Primary Purpose: Operational Efficiency Secondary Purpose: Reliability Priority: Recommended Total Project Spending: $788,616	This project is an upgrade of existing overhead, three-phase facilities along Route 5 in Westminster with larger poles and conductors.	The primary purpose is to update and replace highly aged and undersized facilities and to allow for more capacity in the Westminster area. The current poles and #2 copper wires have an average age of 75 years. The larger wire and poles will allow for greater capacity in the area. It will add greater storm hardening in the area for improved reliability to the circuit. The installed spacer cable will add to reliability in the area as well.
130658: Hartland Line 9 & 901	Project Type: Distribution Lines In-Service Month: 5 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Operational Efficiency Priority: Recommended Total Project Spending: $411,214	This project is a rebuild and relocation of lines 9 and 901 from off-road to the road in the Town of Hartland.	The primary purpose of this project is to update and replace aged and highly deteriorating facilities and bring some of the pole plant that is currently off-road to the road. Existing facilities have an average pole age of 70 years. The bare wire on this line has seen excessive damage from storms and tree contact. Wire splices are present. Adding a covered wire and bringing poles to the road will significantly improve the reliability of this line. During peak load times, (extreme heat or extreme cold) we have found this piece of line to be overloaded in its capacity to carry load due to wire size. The overloading effect has created entire substation/circuit level outages during these peak times. With this project, the overloading effect will be resolved and reliability improved for customers.
141211: Coolidge State Park	Project Type: Distribution Lines In-Service Month: 5 In-Service Year: 2018 Primary Purpose: Safety Secondary Purpose: Reliability Priority: Required Total Project Spending: $509,837	This project is a distribution line upgrade in Coolidge State Park in Plymouth, Vermont.	The primary purpose is to update and replace aged and highly deteriorating facilities. The existing facilities have an average pole age of 53 years. The existing poles have been clawed and chewed by black bears to such a degree that there now is a serious safety issue for utility crews to work on and climb these off-road facilities for maintenance and outage restoration purposes. Additionally, the bare wire on this line has seen excessive damage from storms and tree contact. Wire splices are present. Adding a covered wire will significantly improve the reliability of this line. While GMP would prefer to move these facilities roadside, they are located within a Vermont state park, and GMP's request to move these facilities road-side was denied. For this reason, GMP is rebuilding and replacing this line in its current off-road corridor. It should be noted that one section of this line servicing one meter point is being left as is, as we work with the state park to deliver an alternative battery storage solution to feed this service point in the future.
141961: Spear St 32G7 & 78G2 Tie Line	Project Type: Distribution Lines In-Service Month: 5 In-Service Year: 2018 Primary Purpose: Operational Efficiency Secondary Purpose: Reliability Priority: Strategic Total Project Spending: $451,964	This project is a reconductoring of Spear Street and Swift street in South Burlington.	The primary purpose is to update and replace ageing facilities and to improve capacity for feeder back-up capabilities for the 32G7 and the 78G2. This project will enable full feeder back-up capability for circuits out of Queen City and the Dorset St substations, which will improve reliability in this well-populated and growing area.

Project Number and Title	Additional Information	Project Description	Project Justification
149662: Tie Line L51 & L11 Bennington	Project Type: Distribution Lines In-Service Month: 5 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Operational Efficiency Priority: Strategic Total Project Spending: $735,391	This project is a rebuild and construction as a tie line from Bennington to Pownal along Route 7. This project dovetails into associated project 149663 Pownal -Bennington tie.	The primary purpose of this project is to update and replace aged and highly deteriorating overhead facilities and to establish permanent feeder back-up capabilities to both Pownal and Bennington substations. The current configuration has the entire village of Pownal feeding from a single-source, radial transmission line. Currently when a significant outage occurs on this transmission line, there is no feeder back-up. Installing this feeder back-up scheme will significantly improve reliability to the Pownal area and allow GMP to maintain the radial transmission line without taking an outage at the Pownal substation by feeding the Pownal area from Bennington.
130492: Royalton Line 29 P#34-to 75	Project Type: Distribution Lines In-Service Month: 6 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Operational Efficiency Priority: Strategic Total Project Spending: $1,132,146	This project is a rebuild and relocation of a portion of Line 29 that feeds the Village of South Royalton and the Vermont Law School. This rebuild consists of roughly 41 sections or approximately 4.5 miles of line 29 that is currently off the road.	The primary purpose is to update and replace aged and highly deteriorating facilities and bring some of the pole plant that is currently off-road to the road. Existing facilities have an average pole age of 55 years. The bare wire on this line has seen excessive damage from storms and tree contact. Many wire splices are present. The off-road nature of this line adds considerable amount of time to of restoration efforts during outage events. Adding a covered wire and bringing the poles to the road will significantly improve the reliability of this line and improve employee safety. This line is on the BE-G29 circuit. This circuit is on GMP's worst circuits list. This project is an effort to storm harden the entire line in conjunction with one other project on this circuit. The project will achieve greater reliability for the Bethel and Royalton areas.
130655: Readsboro Line VH3A	Project Type: Distribution Lines In-Service Month: 6 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Operational Efficiency Priority: Strategic Total Project Spending: $444,093	This project is a rebuild and relocation of line VH3A from pole 13 to pole 43 to roadside on Bosley Hill, Shippee Rd, West Hill Rd and Branch Hill Road in Readsboro, Vermont.	The primary purpose is to update and replace aged and highly deteriorating facilities and bring a majority of the pole plant that is currently off-road to the road. The current location of this line and terrain that it is located in is of dense fir trees. Patrolling and restoring the line during outage events is challenging with potential natural hazards and is very time consuming in this very rural area. The existing facilities have an average pole age of 70 years. The bare wire on this line has seen excessive damage from storms and tree contact. Wire splices are present. Adding a covered wire and bringing the poles to the road will significantly improve the reliability of this line as well as worker safety.
146655: 44G2 Rebuild - Williston	Project Type: Distribution Lines In-Service Month: 6 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Operational Efficiency Priority: Recommended Total Project Spending: $368,641	This project is a rebuild and replacement of the 44G2 in Williston.	The primary purpose of this project is to update and replace aged and highly deteriorating facilities and bring a small portion of the pole plant that is currently off-road to the road. Existing facilities have an average pole age of 55 years. The 4/0 copper wire on this line has seen excessive damage from storms and tree contact. This wire has been the direct cause of recent outages because of splices failing as well as wire melting in a previous compromised location that was not identified during a previous infrared scan. Adding a storm hardened covered wire and bringing poles to the road will significantly improve the reliability of this line that feeds a critical facility - the Burlington International Airport. Moving line to the roadside also reduces risks to employees.
149663: Pownal Tie w/ Bennington	Project Type: Distribution Lines In-Service Month: 6 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Operational Efficiency Priority: Strategic Total Project Spending: $1,221,859	This project is a rebuild and construction of an S tie line from Pownal to Bennington along Route 7.This Project Dovetails with project 149662 Bennington pownal tie.	The primary purpose of this project is to update and replace aged and highly deteriorating overhead facilities and to establish permanent feeder back-up capabilities to both Pownal and Bennington substations. The current configuration has the entire village of Pownal feeding from a single source radial transmission line. Currently when a significant outage occurs on this transmission line, there is no feeder back-up. Installing this feeder back-up scheme will significantly improve reliability to the Pownal area and allow GMP to maintain the radial transmission line without taking an outage at the Pownal substation by feeding the Pownal area from Bennington.
153711: Stonehedge	Project Type: Distribution Lines In-Service Month: 6 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Recommended Total Project Spending: $727,019	This project is to replace & relocate failing direct-buried underground primary & secondary lines along Cedar Glen Drive at the Stonehedge development in South Burlington.	The primary purpose is to update and replace aged and highly deteriorating underground facilities. Existing underground facilities have an average age of 45 years. These facilities were originally installed without conduit systems, equipment bases and sectionalizing devices that are today's standard. This specific development has seen many outages because of failing underground cables. Additionally, a new underground system will allow for safer operational maintenance for GMP crews and the general public.
153149: Line 613 Notch Road Tie	Project Type: Distribution Lines In-Service Month: 7 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Operational Efficiency Priority: Strategic Total Project Spending: $335,328	This project will build and upgrade a single-phase tie line from Lower Notch Road on the HR-G37 circuit to Upper Notch Road to the HR-G38 to refeed line 746 in the Town of Bristol.	The primary purpose of this project is to create a new feed for a portion of line 746, which is at the very end of a poor-performing radial circuit on the HR-G38 and to refeed it to a shorter, less-exposed circuit on the HR- G37. The HR-G38 is one of our top 20 worst preforming circuits and is located in a very rural area prone to significant weather events. We will update and replace an aged portion of the existing plant on Lower Notch Road to storm-harden this feed. Existing facilities have an average pole age of 40 years. The secondary purpose is to add the capability to use this circuit as a feeder backup. Adding a covered wire and installing poles along the roadside to refeed line 746 will significantly increase reliability of this line and add future feeder backup capabilities.
159358: Barre Conv - 37Cir	Project Type: Distribution Lines In-Service Month: 7 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Required Total Project Spending: $1,192,439	This project will convert Substation 37 and its circuits to the modern standard voltage of 7200/12470 volts. There are presently two circuits operating at 2400/4160 volts that will be converted as part of this project. Additionally, work is being done to convert parts of an existing 2400 delta power circuit to 7200/12470 volts. This overall project has been separated into 14 smaller projects for better management. Conversion work for all these projects consist of changing transformers, reconductoring primary wire and changing poles.	The primary purpose is to update and replace aged and highly deteriorating facilities. The pole plant in Barre City has an average age of 63 years and does not meet our present standards for safety clearances. These poles must be replaced in order to accommodate new conductor, which is required in many locations The current need is to supply substation feeder backup to Barre's south end substation # 37 from Barre substation # 26 while substation #37 is being rebuilt under a CPG-issued capital project.

Project Number and Title	Additional Information	Project Description	Project Justification
126847: Rte 7 Brandon URD	Project Type: Distribution Lines In-Service Month: 9 In-Service Year: 2018 Primary Purpose: Regulatory Compliance Secondary Purpose: Reliability Priority: Required Total Project Spending: $467,750	Relocation of GMP's existing overhead facilities located in the state highway right of way in the village of Brandon to underground facilities.	The Town of Brandon and the Vermont AOT initiated a project to upgrade and beautify Main Street Brandon. This is per the regulatory request of the village of Brandon and Vermont Agency of Transportation (AOT). The request was made to all utilities, including GMP, to relocate their existing facilities, along Main Street to underground facilities. This request has a required completion date of late September 2018.
130274: E. Barnard Line 01	Project Type: Distribution Lines In-Service Month: 9 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Operational Efficiency Priority: Strategic Total Project Spending: $834,921	This project involves upgrading GMP's 01 transmission/distribution line, which provides distribution service in Barnard, as well as providing power to GMP's Sharon Substation. This proposed project will relocate existing line from the off-road corridor to the East Barnard and Broad Brook Road in East Barnard.	The primary purpose of this project is to update and replace aged and highly deteriorating facilities and bring the majority of the pole plant that is currently off-road to the road. Existing facilities have an average pole age of 40 years. The bare wire on this line has seen excessive damage from storms and tree contact. Many wire splices are present. Adding a covered wire and bringing poles to the road will significantly improve the reliability of this line. The 01 line is a single-sourced radial line that runs from the East Barnard substation to feed the Sharon substation and the SH-G35 circuit. This SH-G35 circuit is on GMP's 4.900 worst circuits list. This project is an effort to storm-harden the entire line in conjunction with other projects on this circuit/line which are in various stages. With this project, GMP can achieve greater reliability to the E. Barnard and Sharon area as well as remove the SH-G35 from the worst circuit list. GMP received an act 248 Permit for this project in October of 2017.
150300: Milton Line 42	Project Type: Distribution Lines In-Service Month: 9 In-Service Year: 2018 Primary Purpose: Operational Efficiency Secondary Purpose: Reliability Priority: Strategic Total Project Spending: $516,114	This project is to replace and upgrade overhead line facilities and add an additional feed from the MI-G36 Cir to the Milton Industrial Park.	The primary purpose is to add to the capacity to this area of this circuit, which is currently pushing the threshold of operational overloading. The goal of this project is to tie together the West Milton G92 circuit to the Milton G36 circuit. This circuit tie will allow for feeder back up and adequate load distribution over the two circuits and ensures our ability to properly serve customers in this area.
150420: Hydeville Line 4	Project Type: Distribution Lines In-Service Month: 9 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Operational Efficiency Priority: Strategic Total Project Spending: $254,859	This project is to rebuild and reconductor L 4 Poles 2 to 57 in Castleton Corners.	The primary purpose of this project is to update and replace aged and highly deteriorating facilities and bring some of the pole plant that is currently off-road to the road. Existing facilities have an average pole age of 40 years. The bare wire on this line is very small and has seen excessive damage from storms and tree contact. Wire splices are present. The secondary purpose is to improve the capability to use this circuit as a feeder backup and additional capacity. Adding a covered wire and bringing poles to the road will significantly improve line capacity as well as create feeder back up capabilities, improving the reliability of this line, while also reducing safety risks from working off road.
127963: Winhall Line 533	Project Type: Distribution Lines In-Service Month: 10 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Operational Efficiency Priority: Strategic Total Project Spending: $428,097	This project is a rebuild and reconductoring of Winhall L 533 P 21 to 52 Upper Taylor Hill Rd in the Winhall area. As part of the rebuild and reconductoring, the line will be moved from its existing off-road corridor to the road.	The primary purpose of this project is to update and replace aged and highly deteriorated facilities and bring some of the pole plant that is currently off-road to the road. Existing facilities have an average pole age of 55 years. The bare wire on this line has seen excessive damage from storms and tree contact. Many wire splices are present. Adding a covered wire and bringing poles to the road will significantly improve the reliability of this line for customers and improve worker safety.
148867: Ottauquechee Hydro Fiber	Project Type: Distribution Lines In-Service Month: 10 In-Service Year: 2018 Primary Purpose: Operational Efficiency Secondary Purpose: Safety Priority: Strategic Total Project Spending: $321,010	This project is a make-ready project to replace poles to allow for the installation of All dielectric self-supporting (ADSS) fiber and two (2) three-phase electronic reclosers.	The primary purpose of this project is to update and replace aged and undersized poles to allow for the installation of fiber. The fiber is a necessary component of a direct transfer trip (DTT) protection scheme to safely support various solar and hydro generators currently operating on this circuit. The DTT is necessary at this time in this area to prevent islanding of these generators during circuit level outages. The islanding phenomenon is an unsafe inefficient way to operate. The DTT Scheme is necessary on this circuit at this time because this circuit currently has a significant amount of larger electric generators (hydro, solar) operating and pushing electrons back on the GMP system without the DTT communication. GMP foresees that more generation will be added. The DTT protection scheme will allow the generators to operate in coordination with the GMP system in a safe and efficient manner.
153389: 2018 Distribution Lines Blanket	Project Type: Distribution Lines In-Service Month: Oct-2017 - Sept-2018 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Required Total Project Spending: $16,798,224	Blankets are generally used for categories of spending where the anticipated level and need for the spending is known based on historical experience, but the exact location of work or the individual projects that will be required cannot always be known in advance. For the Distribution Line Blanket the Projects in these categories may include but are not limited to (1) reconstruction and rebuild projects primarily for safety, efficiency, and reliability of the distribution system; (2) road relocation projects (relocating T&D facilities for state- or municipality-initiated road or bridge construction); and (3) third-party reconstruction project (telephone or cable requests to upgrade and relocate joint facilities).These projects are primarily necessary to address safety and reliability. GMP continually examines our equipment and circuits to identify capital reconstruction and additions based on asset management, outage history and impact on customers, safety of employees and customers and cost. The Distribution Line Blanket amount placed in rate base is the lesser of either the 5-year historical average of capital spending adjusted for inflation or the current year budget for distribution line blanket. This blanket is for projects that help assure system capability and reliability on the distribution system. This work includes expenditures for addressing asset management concerns, relocating and reconductoring lines, voltage conversions, feeder backup and fuse coordination. Overhead line projects typically include the installation of poles, cross arms, anchors, wire, service conductor and associated hardware. Underground projects include pad mounts, terminating cabinets, URD cable, and terminators for underground lines.	The GMP system has approximately 13,000 miles of Distribution line requiring the continual review of this infrastructure to proactively address asset management issues, line protection, feeder backup capability and changing system conditions pertaining to loads and distributed generation. This is essential to prevent adverse impacts to customers or employees. GMP cannot dictate the timing of many of these types of projects —like when the state or municipality decides a line must be relocated, a customer needs a service installed, a renewable energy project must be interconnected, or a car damages a pole. These very events can affect the timing of construction and in-service dates for planned GMP projects, which is precisely why it is important to keep them in the blanket. This does not make the projects unimportant; it just means they cannot always be planned in advance. The need to quickly undertake these thousands of projects, coupled with the difficulty of predicting when they will occur, given the many factors affecting their timing, requires us to have a financial mechanism to address these needs quickly and efficiency. In this way, when the projects are ready to construct, GMP can get them done for our customers.

Project Number and Title	Additional Information	Project Description	Project Justification
153389: 2019 Distribution Lines Blanket	Project Type: Distribution Lines In-Service Month: Oct-2018 - Dec-2018 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Required Total Project Spending: $4,254,150	Blankets are generally used for categories of spending where the anticipated level and need for the spending is known based on historical experience, but the exact location of work or the individual projects that will be required cannot always be known in advance. For the Distribution Line Blanket the Projects in these categories may include but are not limited to (1) reconstruction and rebuild projects primarily for safety, efficiency, and reliability of the distribution system; (2) road relocation projects (relocating T&D facilities for state- or municipality-initiated road or bridge construction); and (3) third-party reconstruction project (telephone or cable requests to upgrade and relocate joint facilities).These projects are primarily necessary to address safety and reliability. GMP continually examines our equipment and circuits to identify capital reconstruction and additions based on asset management, outage history and impact on customers, safety of employees and customers and cost. The Distribution Line Blanket amount placed in rate base is the lesser of either the 5-year historical average of capital spending adjusted for inflation or the current year budget for distribution line blanket. This blanket is for projects that help assure system capability and reliability on the distribution system. This work includes expenditures for addressing asset management concerns, relocating and reconductoring lines, voltage conversions, feeder backup and fuse coordination. Overhead line projects typically include the installation of poles, cross arms, anchors, wire, service conductor and associated hardware. Underground projects include pad mounts, terminating cabinets, URD cable, and terminators for underground lines.	The GMP system has approximately 13,000 miles of Distribution line requiring the continual review of this infrastructure to proactively address asset management issues, line protection, feeder backup capability and changing system conditions pertaining to loads and distributed generation. This is essential to prevent adverse impacts to customers or employees. GMP cannot dictate the timing of many of these types of projects —like when the state or municipality decides a line must be relocated, a customer needs a service installed, a renewable energy project must be interconnected, or a car damages a pole. These very events can affect the timing of construction and in-service dates for planned GMP projects, which is precisely why it is important to keep them in the blanket. This does not make the projects unimportant; it just means they cannot always be planned in advance. The need to quickly undertake these thousands of projects, coupled with the difficulty of predicting when they will occur, given the many factors affecting their timing, requires us to have a financial mechanism to address these needs quickly and efficiency. In this way, when the projects are ready to construct, GMP can get them done for our customers.
Distribution Lines - Rate Period (Jan. - Sept. 2019)			
155199: Bethel 28Cir -line 5	Project Type: Distribution Lines In-Service Month: 1 In-Service Year: 2019 Primary Purpose: Reliability Secondary Purpose: Operational Efficiency Priority: Strategic Total Project Spending: $861,561	This project is a rebuild and relocation of the Bethel 28 circuit from the substation to Route 107 West.	The primary purpose is to update and replace aged and highly deteriorating facilities and bring some of the pole plant that is currently off-road to the road. Existing facilities have an average pole age of 30 years. Adding a covered spacer cable wire and bringing poles to the road will significantly improve the reliability of this line. This line is on the BE-G28 circuit. This circuit is on GMP's worst circuits list. This project is an effort to storm-harden the entire line in conjunction with other projects on this circuit/line. With these efforts, we can achieve greater reliability to the Bethel area.
158518: Sheldon Line 9 Phase 1	Project Type: Distribution Lines In-Service Month: 2 In-Service Year: 2019 Primary Purpose: Reliability Secondary Purpose: Operational Efficiency Priority: Recommended Total Project Spending: $552,092	This project is a relocation of Line 9 in Sheldon from Pole 36 to Pole 58 from the off-road to the road. It is part of a three-part project to improve service in the Sheldon area.	The primary purpose is to update and replace aged and highly deteriorating facilities and bring some of the pole plant that is currently off road to the road. Existing facilities have an average pole age of 52 years. The bare wire on this line has seen excessive damage from storms and tree contact. Many wire splices are present. Adding a covered wire and bringing poles to the road will significantly improve reliability of this line. This project is phase one of a three-phase project. Phases 2-3 are forecasted for calendar year 2019.
127178: Hartland Line 971 & 9711	Project Type: Distribution Lines In-Service Month: 3 In-Service Year: 2019 Primary Purpose: Reliability Secondary Purpose: Operational Efficiency Priority: Strategic Total Project Spending: $320,382	This project is a reconstruction and relocation of Line 971 Poles 1 to Pole 16 in the Town of Hartland.	The primary purpose of this project is to update and replace aged and highly deteriorating facilities and bring some of the pole plant that is currently off-road to the road. Existing facilities have an average pole age of 70 years. The bare wire on this line has seen excessive damage from storms and tree contact. Wire splices are present. Adding a covered wire and bringing poles to the road will significantly improve the reliability of this line.
152181: Royalton Line 29 Phase II	Project Type: Distribution Lines In-Service Month: 3 In-Service Year: 2019 Primary Purpose: Reliability Secondary Purpose: Operational Efficiency Priority: Strategic Total Project Spending: $722,341	This project is a rebuild and relocation of Line 3 from the Bethel substation to Waterman Road in Royalton.	The primary purpose of this project is to update and replace aged and highly deteriorating facilities and bring some of the pole plant that is currently off-road to the road. Existing facilities have an average pole age of 67 years. Adding a covered wire and bringing poles to the road will significantly improve the reliability of this line. This line is on the BE-G29 circuit. This circuit is one of GMP's worst circuits. This project is an effort to storm-harden the entire line in conjunction with another project on this circuit. With these efforts we can achieve greater reliability to the Bethel- and Royalton-area customers.
130049: Athens Line 3 - Hendrix	Project Type: Distribution Lines In-Service Month: 4 In-Service Year: 2019 Primary Purpose: Reliability Secondary Purpose: Operational Efficiency Priority: Required Total Project Spending: $565,565	This project is a rebuild and relocation of the Athens line 3, poles 453-502.	The primary purpose of this project is to update and replace aged and highly deteriorating facilities and bring some of the pole plant that is currently off road to the road. Existing facilities have an average pole age of 89 years. Patrolling and restoring the line during outage events is challenging with potential natural hazards and is very time consuming in this very rural area. The bare wire on this line has seen excessive damage from storms and tree contact. Many wire splices are present. Adding a covered wire and bringing poles to the road will significantly improve reliability of this line and reduce worker safety risks.
146574: North Williston Rd	Project Type: Distribution Lines In-Service Month: 4 In-Service Year: 2019 Primary Purpose: Operational Efficiency Secondary Purpose: Reliability Priority: Strategic Total Project Spending: $636,912	This project is a rebuild and replacement of poles and wire along North Williston Road, Williston.	The primary purpose of this project is to update and replace aging overhead facilities for improved capacity and for potential feeder backup capabilities. This project is necessary at this time due to the necessity to add capacity to this area of this circuit that is currently pushing the threshold of operational overloading. A secondary goal of this project is to be able to tie multiple circuits together for feeder back up and adequate load distribution over the multiple circuits.

Project Number and Title	Additional Information	Project Description	Project Justification
148126: Shoreham Line 84	Project Type: Distribution Lines In-Service Month: 4 In-Service Year: 2019 Primary Purpose: Reliability Secondary Purpose: Operational Efficiency Priority: Strategic Total Project Spending: $328,965	This project is a rebuild and relocation of Shoreham Line 84 Poles 24 to 45 and Line 841 Poles 1 to 10-4.	The primary purpose is to update and replace aged and highly deteriorating facilities and bring some of the pole plant that is currently off-road to the road. Existing facilities have an average pole age of 73 years. The bare wire on this line has seen excessive damage from storms and tree contact. Wire splices are present. Adding a covered wire and bringing poles to the road will significantly improve the reliability of this line for customers.
151052: Middletown Springs Line 7	Project Type: Distribution Lines In-Service Month: 4 In-Service Year: 2019 Primary Purpose: Reliability Secondary Purpose: Operational Efficiency Priority: Strategic Total Project Spending: $455,400	This project is a reconductor and relocation of Line 7 P 223 to P 261 in Middletown Springs.	The primary purpose is to update and replace aged and highly deteriorating facilities and bring some of the pole plant that is currently off-road to the road. Existing facilities have an average pole age of 40 years. Adding a larger covered wire and bringing poles to the road will significantly improve reliability of this line.
153466: Line - Bristol Rte 116	Project Type: Distribution Lines In-Service Month: 6 In-Service Year: 2019 Primary Purpose: Reliability Secondary Purpose: Operational Efficiency Priority: Strategic Total Project Spending: $253,129	This project is a rebuild and relocation of Line 7 poles 35 to 57 along Route 116 in Bristol.	The primary purpose of this project is to update and replace aged and deteriorating facilities and bring some of the pole plant that is currently located on an unstable bank off of the bank and onto the roadside. Existing facilities have an average pole age of 41 years. Adding a covered wire and bringing poles off the unstable bank will significantly add to reliability of this line. This line is the beginning of Line 7 on the HR-G38 circuit. This line is on GMP's worst circuits list. This project is efforts to storm harden the entire Line 7 in conjunction with other projects on this circuit. With these efforts we can achieve greater reliability to the Bristol, Lincoln, and Starksboro area.
158519: Sheldon Line 9 Phase 2	Project Type: Distribution Lines In-Service Month: 6 In-Service Year: 2019 Primary Purpose: Reliability Secondary Purpose: Operational Efficiency Priority: Recommended Total Project Spending: $352,286	This project is a rebuild and relocation a 3-phase line in Sheldon Line 9 pole 45x to pole 55, from the field/woods/swamp area to the road. It is the second part of a three-part project focused on reliability in the Sheldon area.	The primary purpose of this project is to update and replace aged and highly deteriorating facilities and bring some of the pole plant that is currently off-road to the road. Existing facilities have an average pole age of 60 years. Adding a covered wire and bringing poles to the road will significantly improve the reliability of this line.
159467: Waterbury URD	Project Type: Distribution Lines In-Service Month: 8 In-Service Year: 2019 Primary Purpose: Regulatory Compliance Secondary Purpose: Customer Service Priority: Required Total Project Spending: $273,019	This project is a relocation of GMP's existing overhead facilities located in the state highway right of way in the village of Waterbury to underground facilities. This project is being done per the regulatory request of the Village of Waterbury and the Vermont Agency of Transportation (AOT).	The Town of Waterbury and the Vermont AOT initiated a project to upgrade and beautify Main Street in Waterbury. The request was made to all utilities, including GMP, to relocate their existing facilities along Main Street to underground facilities. This request has a required completion date of late July 4, 2019.
149811: E. Lakeshore Dr. rhb P43 - 77	Project Type: Distribution Lines In-Service Month: 9 In-Service Year: 2019 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Recommended Total Project Spending: $568,263	This project is a rebuild of 1.5 miles of main line poles 41-99 along East Lake Shore Drive in Colchester	The primary purpose is to update and replace aged and highly deteriorating facilities and bring some of the pole plant that is currently off-road to the road. Existing facilities have an average pole age of 48 years. Many of the poles are deemed not safe and failed an audit for continued safe operation by our third-party pole inspection contractor Osmose. Adding a covered wire will significantly improve reliability of this line.
153588: Line 74 - Section I	Project Type: Distribution Lines In-Service Month: 9 In-Service Year: 2019 Primary Purpose: Reliability Secondary Purpose: Operational Efficiency Priority: Strategic Total Project Spending: $419,960	This project is a rebuild and relocation of the Lincoln Line 74 from off-road to the road.	The primary purpose of this project is to update and replace aged and highly deteriorating facilities and bring some of the pole plant that is currently off-road to the road. Existing facilities have an average pole age of 48 years. Adding a covered wire and bringing poles to the road will significantly improve the reliability of this line. This line is the beginning of Line 7 on the HR-G38 circuit. This circuit/line is on GMP's worst circuits list and serves a very rural area prone to major weather events. This project is also an effort to storm-harden the entire Line 7 in conjunction with other projects in various stages, on this circuit. With these efforts, we can achieve greater reliability to the Lincoln and Starksboro area.
155051: Newfane Line 6 to line 3	Project Type: Distribution Lines In-Service Month: 9 In-Service Year: 2019 Primary Purpose: Reliability Secondary Purpose: Operational Efficiency Priority: Recommended Total Project Spending: $687,701	This project is a rebuild and relocation of Line 6 from the off-road corridor to the roadside along Route 30.	The primary purpose is to update and replace aged and highly deteriorating facilities and bring some of the pole plant that is currently off-road to the road. Existing facilities have an average pole age of 72 years. Adding a covered wire and bringing poles to the road will significantly improve reliability of this line. This line is on the DM-G6 circuit. This circuit is on GMP's worst circuits list. This project is an effort to storm-harden the entire line in conjunction with other projects on this circuit. With these efforts we can achieve greater reliability to the Newfane-Townshend area.
158520: Sheldon Line 9 Phase III	Project Type: Distribution Lines In-Service Month: 9 In-Service Year: 2019 Primary Purpose: Reliability Secondary Purpose: Operational Efficiency Priority: Recommended Total Project Spending: $407,927	This project is a rebuild and relocation of a 3-phase line in Sheldon Line 9 poles 59-77 from the field/woods/swamp area to the road. It is the third phase of a three-part project.	The primary purpose of this project is to update and replace aged and highly deteriorating facilities and bring some of the pole plant that is currently off-road to the road and improve reliability for customers. Existing facilities have an average pole age of 60 years. Adding a covered wire and bringing poles to the road will significantly improve the reliability of this line and reduce risks to field workers.

Project Number and Title	Additional Information	Project Description	Project Justification
153389: 2019 Distribution Lines Blanket	Project Type: Distribution Lines In-Service Month: Jan-2019 - Sep-2019 In-Service Year: 2019 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Required Total Project Spending: $12,762,451	Blankets are generally used for categories of spending where the anticipated level and need for the spending is known based on historical experience, but the exact location of work or the individual projects that will be required cannot always be known in advance. For the Distribution Line Blanket the Projects in these categories may include but are not limited to (1) reconstruction and rebuild projects primarily for safety, efficiency, and reliability of the distribution system; (2) road relocation projects (relocating T&D facilities for state- or municipality-initiated road or bridge construction); and (3) third-party reconstruction project (telephone or cable requests to upgrade and relocate joint facilities).These projects are primarily necessary to address safety and reliability. GMP continually examines our equipment and circuits to identify capital reconstruction and additions based on asset management, outage history and impact on customers, safety of employees and customers and cost. The Distribution Line Blanket amount placed in rate base is the lesser of either the 5-year historical average of capital spending adjusted for inflation or the current year budget for distribution line blanket. This blanket is for projects that help assure system capability and reliability on the distribution system. This work includes expenditures for addressing asset management concerns, relocating and reconductoring lines, voltage conversions, feeder backup and fuse coordination. Overhead line projects typically include the installation of poles, cross arms, anchors, wire, service conductor and associated hardware. Underground projects include pad mounts, terminating cabinets, URD cable, and terminators for underground lines.	The GMP system has approximately 13,000 miles of Distribution line requiring the continual review of this infrastructure to proactively address asset management issues, line protection, feeder backup capability and changing system conditions pertaining to loads and distributed generation. This is essential to prevent adverse impacts to customers or employees. GMP cannot dictate the timing of many of these types of projects —like when the state or municipality decides a line must be relocated, a customer needs a service installed, a renewable energy project must be interconnected, or a car damages a pole. These very events can affect the timing of construction and in-service dates for planned GMP projects, which is precisely why it is important to keep them in the blanket. This does not make the projects unimportant; it just means they cannot always be planned in advance. The need to quickly undertake these thousands of projects, coupled with the difficulty of predicting when they will occur, given the many factors affecting their timing, requires us to have a financial mechanism to address these needs quickly and efficiency. In this way, when the projects are ready to construct, GMP can get them done for our customers.
Distribution Substation - Interim Period (Oct. 2017 - Dec. 2018)			
156220: Carvers Falls Animal Fence	Project Type: Distribution Substation In-Service Month: 10 In-Service Year: 2017 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Recommended Total Project Spending: $29,096	This Project will enhance reliability with the addition of an animal fence at the GMP Carvers Falls Distribution Substation. This substation serves one 12.47 KV distribution circuit. The animal fence protects substation assets and increases reliability by eliminating outages caused by animal contact.	Since 2015, GMP has experienced eight (8) substation outages due to animal contacts on the substation low-side (12.47 kV) equipment, causing thousands of customers to lose power and nearly 35,000 customer hours without service. These outages have resulted in reliability and power quality impacts to customers as well as equipment damage and have affected customers of all kinds, from thousands of residential customers to hundreds of commercial and industrial customers. Where similar animal protection has been installed in recent years, we have in many cases virtually eliminated animal-caused substation outages. This project will mitigate animal contact in the substation, which can lead to equipment failure. There is over 8 MW of customer load fed directly off this substation during peak times.
156221: Dover Animal Fence	Project Type: Distribution Substation In-Service Month: 10 In-Service Year: 2017 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Recommended Total Project Spending: $34,701	This Project will enhance reliability with the addition of an animal fence at the GMP Dover Distribution Substation. This substation serves two 69/12.47 kV transformer banks serving five 12.47 KV distribution circuits. The animal fence protects substation assets and increases reliability by eliminating outages caused by animal contact.	Since 2015, GMP has experienced eight (8) substation outages due to animal contacts on the substation low-side (12.47 kV) equipment, causing thousands of customers to lose power and nearly 35,000 customer hours without service. These outages have resulted in reliability and power quality impacts to customers as well as equipment damage and have affected customers of all kinds, from thousands of residential customers to hundreds of commercial and industrial customers. Where similar animal protection has been installed in recent years, we have in many cases virtually eliminated animal-caused substation outages. This project will mitigate animal contact in the substation, which can lead to equipment failure. There is over 8 MW of customer load fed directly off this substation during peak times.
156223: Londonderry Animal Fence	Project Type: Distribution Substation In-Service Month: 10 In-Service Year: 2017 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Recommended Total Project Spending: $30,634	This Project will enhance reliability with the addition of an animal fence at the GMP Londonderry Distribution Substation. This substation serves two 12.47 KV distribution circuits. The animal fence protects substation assets and increases reliability by eliminating outages caused by animal contact.	Since 2015, GMP has experienced eight (8) substation outages due to animal contacts on the substation low-side (12.47 kV) equipment, causing thousands of customers to lose power and nearly 35,000 customer hours without service. These outages have resulted in reliability and power quality impacts to customers as well as equipment damage and have affected customers of all kinds, from thousands of residential customers to hundreds of commercial and industrial customers. Where similar animal protection has been installed in recent years, we have in many cases virtually eliminated animal-caused substation outages. This project will mitigate animal contact in the substation, which can lead to equipment failure. There is over 8 MW of customer load fed directly off this substation during peak times.
156225: North Springfield Animal Fence	Project Type: Distribution Substation In-Service Month: 10 In-Service Year: 2017 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Recommended Total Project Spending: $29,438	This Project will enhance reliability with the addition of an animal fence at the GMP North Springfield Distribution Substation. This substation serves one 12.47 KV distribution circuit. The animal fence protects substation assets and increases reliability by eliminating outages caused by animal contact.	Since 2015, GMP has experienced eight (8) substation outages due to animal contacts on the substation low-side (12.47 kV) equipment, causing thousands of customers to lose power and nearly 35,000 customer hours without service. These outages have resulted in reliability and power quality impacts to customers as well as equipment damage and have affected customers of all kinds, from thousands of residential customers to hundreds of commercial and industrial customers. Where similar animal protection has been installed in recent years, we have in many cases virtually eliminated animal-caused substation outages. This project will mitigate animal contact in the substation, which can lead to equipment failure. There is over 8 MW of customer load fed directly off this substation during peak times.

Project Number and Title	Additional Information	Project Description	Project Justification
156227: Weybridge Animal Fence	Project Type: Distribution Substation In-Service Month: 10 In-Service Year: 2017 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Recommended Total Project Spending: $30,919	This Project will enhance reliability with the addition of an animal fence at the GMP Weybridge Distribution Substation. This substation serves two 12.47 KV distribution circuits. The animal fence protects substation assets and increases reliability by eliminating outages caused by animal contact.	Since 2015, GMP has experienced eight (8) substation outages due to animal contacts on the substation low-side (12.47 kV) equipment, causing thousands of customers to lose power and nearly 35,000 customer hours without service. These outages have resulted in reliability and power quality impacts to customers as well as equipment damage and have affected customers of all kinds, from thousands of residential customers to hundreds of commercial and industrial customers. Where similar animal protection has been installed in recent years, we have in many cases virtually eliminated animal-caused substation outages. This project will mitigate animal contact in the substation, which can lead to equipment failure. There is over 8 MW of customer load fed directly off this substation during peak times.
156228: West Dummerston Animal Fence	Project Type: Distribution Substation In-Service Month: 10 In-Service Year: 2017 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Recommended Total Project Spending: $25,088	This Project will enhance reliability with the addition of an animal fence at the GMP West Dummerston Distribution Substation. This substation serves one 12.47 KV distribution circuit. The animal fence protects substation assets and increases reliability by eliminating outages caused by animal contact.	Since 2015, GMP has experienced eight (8) substation outages due to animal contacts on the substation low-side (12.47 kV) equipment, causing thousands of customers to lose power and nearly 35,000 customer hours without service. These outages have resulted in reliability and power quality impacts to customers as well as equipment damage and have affected customers of all kinds, from thousands of residential customers to hundreds of commercial and industrial customers. Where similar animal protection has been installed in recent years, we have in many cases virtually eliminated animal-caused substation outages. This project will mitigate animal contact in the substation, which can lead to equipment failure. There is over 8 MW of customer load fed directly off this substation during peak times.
156229: Vernon Rd. Animal Fence	Project Type: Distribution Substation In-Service Month: 10 In-Service Year: 2017 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Recommended Total Project Spending: $35,501	. This Project will enhance reliability with the addition of an animal fence at the GMP Vernon Road Distribution Substation. This substation serves two 12.47 KV distribution circuits. The animal fence protects substation assets and increases reliability by eliminating outages caused by animal contact.	Since 2015, GMP has experienced eight (8) substation outages due to animal contacts on the substation low-side (12.47 kV) equipment, causing thousands of customers to lose power and nearly 35,000 customer hours without service. These outages have resulted in reliability and power quality impacts to customers as well as equipment damage and have affected customers of all kinds, from thousands of residential customers to hundreds of commercial and industrial customers. Where similar animal protection has been installed in recent years, we have in many cases virtually eliminated animal-caused substation outages. This project will mitigate animal contact in the substation, which can lead to equipment failure. There is over 8 MW of customer load fed directly off this substation during peak times.
156230: Wilmington Animal Fence	Project Type: Distribution Substation In-Service Month: 10 In-Service Year: 2017 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Recommended Total Project Spending: $27,815	This Project will enhance reliability with the addition of an animal fence at the GMP Wilmington Distribution Substation. This substation serves two 12.47 KV distribution circuits. The animal fence protects substation assets and increases reliability by eliminating outages caused by animal contact.	Since 2015, GMP has experienced eight (8) substation outages due to animal contacts on the substation low-side (12.47 kV) equipment, causing thousands of customers to lose power and nearly 35,000 customer hours without service. These outages have resulted in reliability and power quality impacts to customers as well as equipment damage and have affected customers of all kinds, from thousands of residential customers to hundreds of commercial and industrial customers. Where similar animal protection has been installed in recent years, we have in many cases virtually eliminated animal-caused substation outages. This project will mitigate animal contact in the substation, which can lead to equipment failure. There is over 8 MW of customer load fed directly off this substation during peak times.
148596: Sharron Sub - GMP Portion	Project Type: Distribution Substation In-Service Month: 4 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Required Total Project Spending: $354,460	The existing 15kV breaker is 1973 vintage and will be replaced with a new ABB RMAG circuit breaker. The existing distribution steel will be raised to increase clearances and improve safety, and we will add new yard stone, ground grid, new 7200V line VT and fuse, and alternate station service. Insulators and switches will be inspected and changed as necessary. The existing protective relaying will be upgraded to include line voltage sensing and provide SCADA control of new regulators. The existing steel, foundations, security system, conduits, protective relays and fencing will remain the same.	This project is being undertaken at this time to coincide with the upgrades necessary for a large solar project in support of state renewable energy goals. A portable substation will have to be utilized to accommodate the necessary solar project's upgrades as there is no feeder backup option. Therefore, this is the appropriate time to do other asset management upgrades. Least cost planning objectives encourage utilities to consider lost-opportunities and to obtain value for customers through improved service quality. The Sharon substation feeds the SH-G35 circuit, which is one of GMP's 20 worst performing circuits according to the number of customers affected by outages and the number of customer hours-out. In 2017, the Sharon-G35 circuit had a total of 9,554 customers affected with a total of 38,863 customer hours out of service. This project will improve the reliability for this circuit by proactively addressing asset management concerns. The PUC approved this project, in its order in Docket No. 8727 dated July 8, 2016.
153799: Mallets Bay Animal Mitigation	Project Type: Distribution Substation In-Service Month: 4 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Strategic Total Project Spending: $91,408	This Project will enhance reliability with the addition of animal protection on the 34.5 kV bus, disconnect switches, breakers and 34.5/12.47 kV transformer in the GMP Malletts Bay Substation. This substation is part of the network transmission system and also serves two 12.47kV distribution circuits. The animal protection system protects substation assets and increases reliability by eliminating outages caused by animal contact. This engineering process takes into account the different approaches an animal might take that ultimately lead it to make contact by either climbing or flying into the substation. The animal protection is form-fitted for its exact location and placed either on live parts or the ground plane to eliminate the difference of potential in locations where animal contact is most likely to occur.	This project will prevent animal contact issues in the substation, which can lead to equipment failure. GMP has experienced four (4) Chittenden County transmission (34.5 kV) substation outages due to animal contacts within the last two years. These outages have resulted in reliability and power quality impacts to customers as well as equipment damage and failure. There is over 7 MW of customer load fed directly off this substation during peak times, and this substation is a backup for other area circuits for planned outages or contingencies. This animal mitigation on the substation high-side (34.5 kV) equipment will increase reliability for customers fed from Malletts Bay substation, as well as the customers fed off the circuits that can be backed up from this substation.

Project Number and Title	Additional Information	Project Description	Project Justification
143591: South Brattleboro RBLD	Project Type: Distribution Substation In-Service Month: 5 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Required Total Project Spending: $2,625,972	The upgrades to the South Brattleboro substation would be comprised of one new 15/28 MVA, 69 kV to 12.47 kV transformer, oil containment, a 69 kV high-side circuit breaker and associated fence, ground grid, communications and security. In addition, there would be three distribution circuits with associated circuit breakers and 437 amp regulators. Larger regulators would be installed to allow for greater flexibility with circuit ties during planned outages and contingencies. The primary reason for completing this Project is to provide greater area operating flexibility for feeder backup during planned and emergency outages, improving customers' reliability for the entire Brattleboro area.	Presently, the South Brattleboro Substation is home to two transformers: (i) a 3.75/4.687 MVA, 69 kV to 12.47 kV transformer that feeds two circuits; and (ii) a 10/14 MVA, 69 kV to 12.47 kV transformer that feeds two circuits. The 4.687 MVA unit is 54 years old and has limited capacity for feeder backup and has shown signs of gassing. The 14 MVA transformer is 27 years old and is also limited in its ability to provide feeder backup to area substations. The PUC approved this project, reconstruction of the South Brattleboro substation, in its order in Docket No. 8778 dated September 12, 2016. With the existing infrastructure, it has become increasingly difficult to support local planned outages, specifically transfer of the Vernon Road Substation, due to capacity limits at South Brattleboro. Planned work has had to be deferred to times when the system was at lower loads. Restrictions of this kind result in the inability to support unplanned outages, and this negatively affects system reliability for customers. This project will also address equipment reliability and clearance issues in order to improve substation safety and operability, thereby providing greater operating flexibility for feeder backup during planned and emergency outages.
143595: Barre North End	Project Type: Distribution Substation In-Service Month: 6 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Required Total Project Spending: $2,216,427	The rebuild of the Barre #63 North Substation will provide a strong 12.47 kV source for the area. The substation will be designed with a 15 MVA transformer and three circuits to allow for complete feeder backup for the Barre #37 South End substation, and will significantly improve reliability for local residents and businesses. The primary reason for completing this Project is to provide greater area operating flexibility for feeder backup during planned and emergency outages, improving customers' reliability for the entire Barre area.	GMP has a regulatory obligation to address the reliability issues in the Barre area, and it is necessary to provide customers with reliable service. In 2012 and 2013, there were three (3) separate incidents that resulted in substation transformer failures. These incidents each took a transformer out-of-service and caused long-duration outages to the affected customers. These incidents happened on June 8, 2012 for Barre South End, June 29, 2012 for Barre North End and January 30, 2013 for Barre South End. These incidents resulted in the Docket 8069 Order. As part of this plan, GMP engaged in an area study, and this project was identified. The Public Utility Commission (PUC) approved this first segment of the overall strategy, namely the reconstruction and upgrade of the Barre North End substation, in its order in Docket No. 8846 dated February 16, 2017. This project, in combination with the South Barre substation upgrade, will standardize 12.47 kV distribution voltage for the area allowing for feeder backup and improved voltage performance. The majority of the Barre City and Barre Town GMP customers were fed from four (4) different substations supplying three (3) primary voltage levels (12.47 kV, 4.16 kV, and 2.4 kV) and two (2) circuit configurations (delta and grounded-wye). The "mix and match" of operating voltages and configurations were a result of granite industry and other industrial loads that operated a number of large-capacity motors. Also, the 2.4 kV delta and 4.16 kV grounded-wye were the standards of a typical distribution system in the past. Unfortunately, this mix and match of operating voltages and configurations makes it very difficult to provide mutual circuit backups, and confounds any attempt to outfit local crews with standard replacement parts. The combination of low operating voltages such as 2.4 kV and 4.16 kV, coupled with aging equipment, yields poor efficiency due to high impedances and voltage drops. The three (3) incidents that occurred June 8, 2012, June 29, 2012 and January 30, 2013 highlighted the need for enhanced feeder backup for the Barre area substations.
153804: Ethan Allen Animal Mitigation	Project Type: Distribution Substation In-Service Month: 6 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Required Total Project Spending: $125,590	This Project will enhance reliability with the addition of animal protection on the 34.5 kV bus, disconnect switches, breakers and 34.5/12.47 kV transformer at the GMP Ethan Allen substation. This substation is part of the network transmission system and also serves one 34.5 kV circuit and two 12.47kV distribution circuits. The distribution circuits out of this substation provide feeder ties to Gorge and Malletts Bay circuits. The animal protection system protects substation assets and increases reliability by eliminating outages caused by animal contact. This engineering process takes into account the different approaches an animal might take that ultimately lead it to make contact by either climbing or flying into the substation. The animal protection is form fitted for its exact location and placed either on live parts or the ground plane to eliminate the difference of potential in locations where animal contact is most likely to occur.	This project will prevent animal contact issues in the substation, which can lead to equipment failure. GMP has experienced four (4) Chittenden County transmission (34.5 kV) substation outages due to animal contacts within the last two years. These outages have resulted in reliability and power quality impacts to customers as well as equipment damage and failure. There is over 8 MW of customer load fed directly off this substation during peak times and this substation is a backup for other area circuits for planned outages or contingencies. This animal mitigation on the substation high-side (34.5 kV) equipment will increase reliability for customers fed from Ethan Allen substation, as well as the customers fed off the circuits that can be backed up from this substation.
153800: Iroquois Sub Animal Mitigation	Project Type: Distribution Substation In-Service Month: 7 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Required Total Project Spending: $57,817	This Project will enhance reliability with the addition of animal protection on the 34.5 kV bus, disconnect switches, breakers and 34.5/12.47 kV transformer in the GMP Iroquois Substation. This substation is part of the network transmission system and also serves two 12.47kV distribution circuits. The animal protection system protects substation assets and increases reliability by eliminating outages caused by animal contact. This engineering process takes into account the different approaches an animal might take that ultimately lead it to make contact by either climbing or flying into the substation. The animal protection is form fitted for its exact location and placed either on live parts or the ground plane to eliminate the difference of potential in locations where animal contact is most likely to occur.	This project will prevent animal contact issues in the substation, which can lead to equipment failure. GMP has experienced four (4) Chittenden County transmission (34.5 kV) substation outages due to animal contacts within the last two years. These outages have resulted in reliability and power quality impacts to customers as well as equipment damage and failure. There is close to 6 MW of customer load fed directly off this substation during peak times and this substation is a partial backup for other area circuits for planned outages or contingencies. This animal mitigation on the substation high-side (34.5 kV) equipment will increase reliability for customers fed from the Iroquois substation.
153801: Town Line Animal Mitigation	Project Type: Distribution Substation In-Service Month: 7 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Required Total Project Spending: $96,252	This Project will enhance reliability with the addition of animal protection on the 34.5 kV bus, disconnect switches, breakers and 34.5/12.47 kV transformer in the GMP Town Line Substation. This substation is part of the network transmission system and also serves two 12.47kV distribution circuits. The distribution circuits out of this substation provide feeder ties to Digital and Dorset Street circuits. The animal protection system protects substation assets and increases reliability by eliminating outages caused by animal contact. This engineering process takes into account the different approaches an animal might take that ultimately lead it to make contact by either climbing or flying into the substation. The animal protection is form fitted for its exact location and placed either on live parts or the ground plane to eliminate the difference of potential in locations where animal contact is most likely to occur.	This project will prevent animal contact issues in the substation, which can lead to equipment failure. GMP has experienced four (4) Chittenden County transmission (34.5 kV) substation outages due to animal contacts within the last two years. These outages have resulted in reliability and power quality impacts to customers as well as equipment damage and failure. There is over 12 MW of customer load fed directly off this substation during peak times and this substation is a backup for other area circuits for planned outages or contingencies. This animal mitigation on the substation high-side (34.5 kV) equipment will increase reliability for customers fed from Town Line substation, as well as the customers fed off the circuits that can be backed up from this substation.

Project Number and Title	Additional Information	Project Description	Project Justification
153802: Dorset St Animal Mitigation	Project Type: Distribution Substation In-Service Month: 7 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Required Total Project Spending: $88,785	. This Project will enhance reliability with the addition of animal protection on the 34.5 kV bus, disconnect switches, breakers and 34.5/12.47 kV transformer in the GMP Dorset Street Substation. This substation is part of the network transmission system and also serves four 12.47kV distribution circuits. The distribution circuits out of this substation provide feeder ties to Town Line, Digital, Queen City and Shelburne circuits, which include multiple large commercial and industrial customers. The animal protection system protects substation assets and increases reliability by eliminating outages caused by animal contact. This engineering process takes into account the different approaches an animal might take that ultimately lead it to make contact by either climbing or flying into the substation. The animal protection is form fitted for its exact location and placed either on live parts or the ground plane to eliminate the difference of potential in locations where animal contact is most likely to occur.	This project will prevent animal contact issues in the substation, which can lead to equipment failure. GMP has experienced four (4) Chittenden County transmission (34.5 kV) substation outages due to animal contacts within the last two years. These outages have resulted in reliability and power quality impacts to customers as well as equipment damage and failure. There is over 18 MW of customer load fed directly off this substation during peak times, and this substation is a backup for other area circuits for planned outages or contingencies. This animal mitigation on the substation high-side (34.5 kV) equipment will increase reliability for customers fed from Dorset Street substation, as well as the customers fed off the circuits that can be backed up from this substation.
158524: Lyons Street Animal Fence	Project Type: Distribution Substation In-Service Month: 8 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Required Total Project Spending: $40,339	This Project will enhance reliability with the addition of an animal fence at the GMP Lyons Street Distribution Substation. This substation serves two 12.47 KV distribution circuits. The animal fence protects substation assets and increases reliability by eliminating outages caused by animal contact.	Since 2015, GMP has experienced eight (8) substation outages due to animal contacts on the substation low-side (12.47 kV) equipment, causing thousands of customers to lose power and nearly 35,000 customer hours without service. These outages have resulted in reliability and power quality impacts to customers as well as equipment damage and have affected customers of all kinds, from thousands of residential customers to hundreds of commercial and industrial customers. Where similar animal protection has been installed in recent years, we have in many cases virtually eliminated animal-caused substation outages. This project will mitigate animal contact in the substation, which can lead to equipment failure. There is over 8 MW of customer load fed directly off this substation during peak times.
159334: Iroquois Sub Battery Upgrade	Project Type: Distribution Substation In-Service Month: 8 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Required Total Project Spending: $28,281	This project is a reliability and safety project to address asset management concerns with the existing station batteries at the GMP Iroquois substation. This Project is a like in-kind replacement.	This primary reason for this project is reliability issues with the current DC Battery system at the Iroquois Substation. The DC battery system must be maintained to the highest level of reliability. Failure of a DC battery system is not tolerable and will result in critical systems not working properly, leading to safety issues. This project is appropriate at this time because the battery equipment is showing signs of deterioration; specifically, multiple posts are lifting to show where the jars are cracking, which is an indication that the battery should be replaced. Replacement will help prevent unplanned outages and safety issues that will occur if the battery system fails. Replacing this equipment will increase reliability.
148607: South Poultney Xfmr/Fence	Project Type: Distribution Substation In-Service Month: 9 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Required Total Project Spending: $540,462	The primary reason for this Project is reliability to address asset management concerns at GMP South Poultney distribution substation. The existing three single-phase transformers at the South Poultney substation are 1920 vintage. Safety is also enhanced with installation of a new ground grid and advanced security to prevent unauthorized entry into the substation.	The PUC approved this project, in its order in Case No. 17-3428-PET dated December 22, 2017. The project is necessary to replace aged infrastructure. The 1922, 250 kVA South Poultney transformer is the oldest substation power transformer at GMP. The other 2 units, a 250 KVA and a 333 KVA, were manufactured in 1942. These three transformers manufactured in 1942 & 1922 are among the top 10 oldest power transformers still in service on the GMP system. This circuit also lacks distribution tie lines to serve as feeder backup. A substation failure at South Poultney would lead to an extended outage requiring installation of a portable substation. GMP does not have any spare units of this size.
148622: East Jamacia Bkr/Rly/RTU/Sec	Project Type: Distribution Substation In-Service Month: 9 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Recommended Total Project Spending: $534,722	The reliability portion of the project is an in-kind replacement of a breaker, electromechanical relays, and the obsolete remote terminal unit ("RTU"). The three main components include: the 1974 vintage vacuum GE breaker will be replaced with a new ABB RMAG circuit breaker. The electromechanical relays will be replaced with microprocessor relays that will allow remote fault diagnostics and future grid automation. The existing substation Remote terminal unit (RTU) is 1980 vintage electronic technology which is no longer supported by the vendor. In an effort to migrate from the vintage unsupported technology, GMP is planning to replace RTUs over a five-year period, allowing the migration to new technology utilizing digital communication between the master station and field devices. This project will also improve safety. The Project addresses worker safety with the addition of a motor operated switch, ground grid enhancements and a security system. The project focuses on the 414 switch located on the high side of the transformer, adding a motor-operated airbreak (MOAB). Safety is also enhanced with the advanced security to prevent unauthorized entry into the substation.	This project is appropriate at this time to address reliability concerns associated with a remote terminal unit. GMP has a plan to replace obsolete RTUs, which are no longer supported by the vendor, over a five-year period allowing the migration to new technology utilizing superior digital communication between the master station and field devices. In this effort, electromechanical relays and breakers are being replaced as part of the asset maintenance effort. Replacing these items allows an integrated design with standard equipment to be utilized and for future grid automation. The East Jamaica substation serves the EJ-G7 circuit, one of GMP's 20 worst performing circuits according to the number of customers affected by outages and the number of customer hours-out. In 2017, the East Jamaica-G7 circuit had a total of 31,048 customers affected with a total of 101,610 customer hours out of service. This project will improve the reliability for this circuit by proactively addressing asset management concerns.
156226: Sherburne Animal Fence	Project Type: Distribution Substation In-Service Month: 10 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Required Total Project Spending: $30,460	This Project will enhance reliability with the addition of an animal fence at the GMP Sherburne Distribution Substation. This substation serves two 46/12.47 kV transformer banks and four 12.47 KV distribution circuits. The animal fence protects substation assets and increases reliability by eliminating outages caused by animal contact.	Since 2015, GMP has experienced eight (8) substation outages due to animal contacts on the substation low-side (12.47 kV) equipment, causing thousands of customers to lose power and nearly 35,000 customer hours without service. These outages have resulted in reliability and power quality impacts to customers as well as equipment damage and have affected customers of all kinds, from thousands of residential customers to hundreds of commercial and industrial customers. Where similar animal protection has been installed in recent years, we have in many cases virtually eliminated animal-caused substation outages. This project will mitigate animal contact in the substation, which can lead to equipment failure. There is over 8 MW of customer load fed directly off this substation during peak times.

Project Number and Title	Additional Information	Project Description	Project Justification
156300: Wallingford Animal Fence	Project Type: Distribution Substation In-Service Month: 10 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Required Total Project Spending: $31,000	This Project will enhance reliability with the addition of an animal fence at the GMP Wallingford Distribution Substation. This substation serves one 12.47 KV distribution circuit. The animal fence protects substation assets and increases reliability by eliminating outages caused by animal contact.	Since 2015, GMP has experienced eight (8) substation outages due to animal contacts on the substation low-side (12.47 kV) equipment, causing thousands of customers to lose power and nearly 35,000 customer hours without service. These outages have resulted in reliability and power quality impacts to customers as well as equipment damage and have affected customers of all kinds, from thousands of residential customers to hundreds of commercial and industrial customers. Where similar animal protection has been installed in recent years, we have in many cases virtually eliminated animal-caused substation outages. This project will mitigate animal contact in the substation, which can lead to equipment failure. There is over 7 MW of customer load fed directly off this substation during peak times and this substation has no feeder backup.
159238: Spare 5 MVA Transformer	Project Type: Distribution Substation In-Service Month: 12 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Customer Service Priority: Recommended Total Project Spending: $274,460	The purchase of this 5/7 MVA 46x34.5/12.47kV spare transformer is to provide reliability in the event that a less than 7MVA 46/12.47 kV or 34.5/12.47 kV transformer fails.	The primary reason for completing this project is Reliability. GMP ordered a similar unit in 2017 for a spare, but due to a transformer failure at the GMP Rawsonville substation in December 2017, this spare had to be used. We do not currently have any spare transformers of this size available. GMP currently has thirty-six (36) 46/12.47 kV and ten (10) 34.5/12.47 kV transformer units smaller than 7 MVA at various substations. The lead time on transformers of this size are approximately 9 to 12 months, which is why it is imperative that GMP have spare transformers available in the event of a transformer failure.
153545: 2018 WO 34 Dist Subs	Project Type: Distribution Substation In-Service Month: Oct-2017 - Sept-2018 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Required Total Project Spending: $870,822	This Capital Blanket is for expenditures to replace or repair deteriorated or failed equipment in distribution substations in order to maintain system capability and reliability. Typical projects in this blanket include, but are not limited to, the unplanned but necessary replacement of distribution substation equipment such as lightning arresters, batteries, breakers and regulators.	These projects are typically driven by unforeseen deteriorated or failed equipment and are needed immediately for proper system operation.
153545: 2019 WO 34 Dist Subs	Project Type: Distribution Substation In-Service Month: Oct-2018 - Dec-2018 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Required Total Project Spending: $220,536	This Capital Blanket is for expenditures to replace or repair deteriorated or failed equipment in distribution substations in order to maintain system capability and reliability. Typical projects in this blanket include, but are not limited to, the unplanned but necessary replacement of distribution substation equipment such as lightning arresters, batteries, breakers and regulators.	These projects are typically driven by unforeseen deteriorated or failed equipment and are needed immediately for proper system operation.
Distribution Substation - Rate Period (Jan. - Sept. 2019)			
152949: Sand Road 34kV Regulators	Project Type: Distribution Substation In-Service Month: 1 In-Service Year: 2019 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Recommended Total Project Spending: $437,617	The primary reason for this project is reliability. This project will add two sets of 200 amps 34.5 kV circuit regulation at the Sand Hill Road substation for the 33Y3 and 33Y4 circuits and install an animal fence.	GMP needs to do this project because there is no regulation at the existing substation, and the lack of regulation resulted in problems keeping voltage at Sand Hill Road within IEEE voltage standards during a 2016 outage where Essex substation was out of service. Voltage regulators are being added to improve the voltage profile of the 34.5kV distribution load served out of this station. The animal protection fence will help protect substation assets and increases reliability by eliminating outages caused by animal contact.
143593: Barre South End	Project Type: Distribution Substation In-Service Month: 2 In-Service Year: 2019 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Required Total Project Spending: $2,774,100	The rebuild of the Barre #37 South End Substation will provide a second strong 12.47 kV source for the area. The substation will be designed with a 15 MVA transformer and three circuits to allow for complete feeder backup for the Barre #63 North End substation, and will significantly improve reliability for local residents and businesses. The primary reason for completing this Project is to provide greater area operating flexibility for feeder backup during planned and emergency outages, improving customers' reliability for the entire Barre area.	GMP has a regulatory obligation to address the reliability issues in the Barre area, and it is necessary to provide customers with reliable service This is a continuation of the work associated with Docket 8069 in which the Public Utility Commission (PUC) approved the first segment of this overall strategy, namely the reconstruction and upgrade of the Barre North End substation, in its order in Docket No. 8846 dated February 16, 2017. This Barre #63 North End substation rebuild is expected to be completed in mid-2018. GMP received PUC approval for this project (143593), the Barre #37 South Substation, in Case No. 17-3862-PET on November 6, 2017. This project, in combination with the Barre North End substation upgrade, will standardize 12.47 kV distribution voltage for the area allowing for feeder backup and improved voltage performance. The majority of the Barre City and Barre Town GMP customers were fed from four (4) different substations supplying three (3) primary voltage levels (12.47 kV, 4.16 kV, and 2.4 kV) and two (2) circuit configurations (delta and grounded-wye). The "mix and match" of operating voltages and configurations were a result of granite industry and other industrial loads that operated a number of large-capacity motors. Also, the 2.4 kV delta and 4.16 kV grounded-wye were the standards of a typical distribution system in the past. Unfortunately, this mashup makes it very difficult to provide mutual circuit backups, and confounds any attempt to outfit local crews with standard replacement parts. The combination of low operating voltages such as 2.4 kV and 4.16 kV, coupled with aging equipment, yields poor efficiency due to high impedances and voltage drops. Three (3) incidents that occurred June 8, 2012, June 29, 2012 and January 30, 2013 highlighted the need for enhanced feeder backup for the Barre area substations. The lack of feeder backup up as well as the poor plant conditions are the major reasons a long-term plan for the Barre Area substation and distribution system was necessary. These issues cause low efficiency, constraints in GMP operation, poor power quality, reduced reliability, and safety concerns.

Project Number and Title	Additional Information	Project Description	Project Justification
157154: 20 MVA EFACEC Portable Sub	Project Type: Distribution Substation In-Service Month: 3 In-Service Year: 2019 Primary Purpose: Reliability Secondary Purpose: Customer Service Priority: Required Total Project Spending: $1,572,801	The purchase of this 20 MVA 46X34.5/12.47 kV portable substation is to provide reliability support for planned substation construction work, customer support and/or in the event of emergency equipment failures where feeder backup is not available. This portable substation enables restoration of grid service while circumventing damaged substation equipment, allowing for time to repair or replace necessary equipment. This portable substation will have a load tap changer (LTC) allowing for faster deployment than the other portables in the GMP fleet, which require the additional step of installing regulators. It is estimated the LTC could reduce outage time by two hours.	The primary reason for this purchase is to improve system Reliability. The portable substation has many applications to improve reliability for planned and unplanned outages as well as support for other utilities in the time of need. Portable substations are critical pieces of equipment necessary to support and restore service to GMP customers. The addition of another portable substation to the GMP fleet will allow for additional flexibility in scheduling of construction and customer support projects and also reduce exposure for emergency situations. There have been times when all of our large portables have been in service, resulting in exposure in the event of an emergency. GMP has over 200 power transformers and close to 150 distribution substations with 62 transformers 14 MVA or larger that could be impacted by having this portable available. It is no longer as acceptable to take short duration outages for planned work, as it was in the past, due to customers' higher dependence on reliable power. This portable substation also provides expanded coverage in the event of extreme weather, which has been more probable in the past decade. This equipment allows GMP to switch from one task to another relatively easily and quickly. To continue to meet reliability standards as well as construction schedules, GMP must be able to quickly respond to emergency situations to reduce reliability impacts to customers and to support capital/customer project work on planned schedule to assure construction completion dates are met.
159715: Barker Ave Sub Security	Project Type: Distribution Substation In-Service Month: 6 In-Service Year: 2019 Primary Purpose: Safety Secondary Purpose: Reliability Priority: Required Total Project Spending: $71,156	This project is for the installation of a fence security system at the GMP Barker Avenue Substation in St. Johnsbury, Vt. which feeds two distribution circuits. The project is designed to improve safety with remote indication and recording of unauthorized entry into the substation.	This project is being done at this time to continue safety measures in GMP substations and is part of an ongoing effort to increase substation safety. This project is designed to reduce the risk of an unauthorized person entering the substation and reduce the risk of injury or death to that person.
159720: Putney Sub Animal Fence	Project Type: Distribution Substation In-Service Month: 7 In-Service Year: 2019 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Recommended Total Project Spending: $36,485	This Project will enhance reliability with the addition of an animal fence at the GMP Putney Distribution Substation. This substation serves three 8.32 KV distribution circuits. The animal fence protects substation assets and increases reliability by eliminating outages caused by animal contact.	Since 2015, GMP has experienced eight (8) substation outages due to animal contacts on the substation low-side (12.47 kV) equipment, causing thousands of customers to lose power and nearly 35,000 customer hours without service. These outages have resulted in reliability and power quality impacts to customers as well as equipment damage and have affected customers of all kinds, from thousands of residential customers to hundreds of commercial and industrial customers. Where similar animal protection has been installed in recent years, we have in many cases virtually eliminated animal-caused substation outages. This project will mitigate animal contact in the substation, which can lead to equipment failure. There is over 7 MW of customer load fed directly off this substation during peak times and this substation.
159721: Westminster Sub Animal Fence	Project Type: Distribution Substation In-Service Month: 8 In-Service Year: 2019 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Recommended Total Project Spending: $38,725	This Project will enhance reliability with the addition of an animal fence at the GMP Westminster Distribution Substation. This substation serves two 12.47 kV distribution circuits. The animal fence protects substation assets and increases reliability by eliminating outages caused by animal contact.	Since 2015, GMP has experienced eight (8) substation outages due to animal contacts on the substation low-side (12.47 kV) equipment, causing thousands of customers to lose power and nearly 35,000 customer hours without service. These outages have resulted in reliability and power quality impacts to customers as well as equipment damage and have affected customers of all kinds, from thousands of residential customers to hundreds of commercial and industrial customers. Where similar animal protection has been installed in recent years, we have in many cases virtually eliminated animal-caused substation outages. This project will mitigate animal contact in the substation, which can lead to equipment failure. There is over 3 MW of customer load fed directly off this substation during peak times.
159713: Wilmington Sub Security	Project Type: Distribution Substation In-Service Month: 9 In-Service Year: 2019 Primary Purpose: Safety Secondary Purpose: Reliability Priority: Required Total Project Spending: $61,340	This project is for the installation of a fence security system at the GMP Wilmington Substation in Wilmington, VT that serves two distribution circuits including the 56G1 and the 56G2. The project is designed to improve safety with remote indication and recording of unauthorized entry into the substation.	This project is being done at this time to continue safety measures in GMP substations and is part of an ongoing effort to increase substation safety. This project is designed to reduce the risk of an unauthorized person entering the substation and reduce the risk of injury or death to that person.
159714: Winooski Sub Security	Project Type: Distribution Substation In-Service Month: 9 In-Service Year: 2019 Primary Purpose: Safety Secondary Purpose: Reliability Priority: Required Total Project Spending: $67,409	This project is for the installation of a fence security system at the GMP Winooski substation that serves the 46Y1 circuit and provides feeder backup to Ethan Allen 36Y5. The project is designed to improve safety with remote indication and recording of unauthorized entry into the substation.	This project is being done at this time to continue safety measures in GMP substations and is part of an ongoing effort to increase substation safety. This project is designed to reduce the risk of an unauthorized person entering the substation and reduce the risk of injury or death to that person.

Project Number and Title	Additional Information	Project Description	Project Justification
159722: Gilman Sub Animal Fence	Project Type: Distribution Substation In-Service Month: 9 In-Service Year: 2019 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Recommended Total Project Spending: $31,869	This Project will enhance reliability with the addition of an animal fence at the GMP Gilman Distribution Substation. This substation serves one 12.47 KV distribution circuit. The animal fence protects substation assets and increases reliability by eliminating outages caused by animal contact.	Since 2015, GMP has experienced eight (8) substation outages due to animal contacts on the substation low-side (12.47 kV) equipment, causing thousands of customers to lose power and nearly 35,000 customer hours without service. These outages have resulted in reliability and power quality impacts to customers as well as equipment damage and have affected customers of all kinds, from thousands of residential customers to hundreds of commercial and industrial customers. Where similar animal protection has been installed in recent years, we have in many cases virtually eliminated animal-caused substation outages. This project will mitigate animal contact in the substation, which can lead to equipment failure. There is over 1.6 MW of customer load fed directly off this substation during peak times and this substation.
153545: 2019 WO 34 Dist Subs	Project Type: Distribution Substation In-Service Month: Jan-2019 - Sep-2019 In-Service Year: 2019 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Required Total Project Spending: $661,606	This Capital Blanket is for expenditures to replace or repair deteriorated or failed equipment in distribution substations in order to maintain system capability and reliability. Typical projects in this blanket include, but are not limited to, the unplanned but necessary replacement of distribution substation equipment such as lightning arresters, batteries, breakers and regulators.	These projects are typically driven by unforeseen deteriorated or failed equipment and are needed immediately for proper system operation.
Meters - Interim Period (Oct. 2017 - Dec. 2018)			
153691: 2018 Meters, CTs, VTs	Project Type: Meters In-Service Month: Quarterly Oct-2017 - Sep-2018 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Customer Service Priority: Required Total Project Spending: $861,346	This blanket covers purchases for meter additions and metering instrument transformers.	These purchases are necessary for proper customer service and reliability.These upgrades are required because: 1. Deteriorated and failed meters must be replaced to maintain customer service. 2. Meter additions are necessary to accommodate changes in rate design. 3. Meter CTs and VTs are necessary to support proper system operation including substation protection. This equipment is used to provide voltage information to protective equipment, and the SCADA for remote indication. 4. Meter additions and replacements are necessary to facilitate substation and circuit monitoring.
159517: 2019 Meters, CTs, VTs	Project Type: Meters In-Service Month: 12 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Customer Service Priority: Required Total Project Spending: $208,768	This blanket covers purchases for meter additions and metering instrument transformers.	These purchases are necessary for proper customer service and reliability.These upgrades are required because: 1. Deteriorated and failed meters must be replaced to maintain customer service. 2. Meter additions are necessary to accommodate changes in rate design. 3. Meter CTs and VTs are necessary to support proper system operation including substation protection. This equipment is used to provide voltage information to protective equipment, and the SCADA for remote indication. 4. Meter additions and replacements are necessary to facilitate substation and circuit monitoring.
Meters - Rate Period (Jan. - Sept. 2019)			
159517: 2019 Meters, CTs, VTs	Project Type: Meters In-Service Month: 3,6,9 In-Service Year: 2019 Primary Purpose: Reliability Secondary Purpose: Customer Service Priority: Required Total Project Spending: $626,298	This blanket covers purchases for meter additions and metering instrument transformers.	These purchases are necessary for proper customer service and reliability.These upgrades are required because: 1. Deteriorated and failed meters must be replaced to maintain customer service. 2. Meter additions are necessary to accommodate changes in rate design. 3. Meter CTs and VTs are necessary to support proper system operation including substation protection. This equipment is used to provide voltage information to protective equipment, and the SCADA for remote indication. 4. Meter additions and replacements are necessary to facilitate substation and circuit monitoring.
Regulators and Capacitors - Interim Period (Oct. 2017 - Dec. 2018)			
141719: Regulators and capacitors	Project Type: Regulators and Capacitors In-Service Month: Quarterly Oct-2017 - Sep-2018 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Customer Service Priority: Required Total Project Spending: $1,030,733	This blanket covers the purchase and installation of regulator and capacitor units, which provide voltage support to the electrical system. These units are replaced as failures are experienced or added as needed to assure adequate system performance. These purchases are necessary for proper customer service and reliability. The capital blanket is based on the 5-year average of capital spending.	Regulators and capacitors are necessary to assure adequate voltage, stays within ANSI standards, for proper system performance and operation. This equipment may be required to allow for feeder backup. They must be replaced in the event of a failure. More specifically, this equipment is necessary because: 1. Deteriorated and failed regulators and capacitors must be replaced to assure proper system operation. 2. Capacitors and regulators will be added to improve the efficiency and performance of the distribution system. 3. Proper VAR compensation provides for cost-effective power delivery and may postpone investment in system facilities. This is a requirement of the ISO Operating Practice OP17.
141719: Regulators and capacitors	Project Type: Regulators and Capacitors In-Service Month: 12 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Customer Service Priority: Required Total Project Spending: $261,033	This blanket covers the purchase and installation of regulator and capacitor units, which provide voltage support to the electrical system. These units are replaced as failures are experienced or added as needed to assure adequate system performance. These purchases are necessary for proper customer service and reliability. The capital blanket is based on the 5-year average of capital spending.	Regulators and capacitors are necessary to assure adequate voltage, stays within ANSI standards, for proper system performance and operation. This equipment may be required to allow for feeder backup. They must be replaced in the event of a failure. More specifically, this equipment is necessary because: 1. Deteriorated and failed regulators and capacitors must be replaced to assure proper system operation. 2. Capacitors and regulators will be added to improve the efficiency and performance of the distribution system. 3. Proper VAR compensation provides for cost-effective power delivery and may postpone investment in system facilities. This is a requirement of the ISO Operating Practice OP17.

Project Number and Title	Additional Information	Project Description	Project Justification
Regulators and Capacitors - Rate Period (Jan. - Sept. 2019)			
141719: Regulators and capacitors	Project Type: Regulators and Capacitors In-Service Month: 3,6,9 In-Service Year: 2019 Primary Purpose: Reliability Secondary Purpose: Customer Service Priority: Required Total Project Spending: $783,099	This blanket covers the purchase and installation of regulator and capacitor units, which provide voltage support to the electrical system. These units are replaced as failures are experienced or added as needed to assure adequate system performance. These purchases are necessary for proper customer service and reliability. The capital blanket is based on the 5-year average of capital spending.	Regulators and capacitors are necessary to assure adequate voltage, stays within ANSI standards, for proper system performance and operation. This equipment may be required to allow for feeder backup. They must be replaced in the event of a failure. More specifically, this equipment is necessary because: 1. Deteriorated and failed regulators and capacitors must be replaced to assure proper system operation. 2. Capacitors and regulators will be added to improve the efficiency and performance of the distribution system. 3. Proper VAR compensation provides for cost-effective power delivery and may postpone investment in system facilities. This is a requirement of the ISO Operating Practice OP17.
Transformers - Interim Period (Oct. 2017 - Dec. 2018)			
141720: Distribution Transformers Install	Project Type: Transformers In-Service Month: Quarterly Oct-2017 - Sep-2018 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Customer Service Priority: Required Total Project Spending: $3,713,335	This blanket covers purchases and installation of distribution line, pole and padmount transformers for the distribution system. These purchases are necessary for providing electric service to our customers. The Distribution Transformer Blanket amount placed in rate base is the current year budget for meter equipment (meters, VTs, CTs).	These purchases are typically determined by the failure rate of existing transformers that need immediate replacement. Transformers are a necessary piece of equipment in order to provide electric service to customers. Specifically, these capital blanket work order expenditures are necessary because: 1. Deteriorated and failed transformer units must be replaced to maintain customer service. 2. The installation of new transformers will improve system efficiency and performance. New transformer purchases are based on a transformer purchase formula that evaluates total owning cost based on purchase price, no load loss (kW) and full load winding loss (kW) consistent with methodologies described in the Company's Integrated Resource Plan. 3. Transformer units will have to be replaced as part of voltage conversion projects due to different equipment ratings. All distribution transformers are purchased on the basis of a Transformer Loss Formula as required in the GMP Integrated Resource Plan, previously reviewed and approved by the PUC. This loss formula enables GMP to add transformers to its inventory that are the lowest life-cycle cost based on both the first cost of a given unit and the expected cost of demand and energy losses over the unit's life.
141720: Distribution Transformers Install	Project Type: Transformers In-Service Month: 12 In-Service Year: 2019 Primary Purpose: Reliability Secondary Purpose: Customer Service Priority: Required Total Project Spending: $901,908	This blanket covers purchases and installation of distribution line, pole and padmount transformers for the distribution system. These purchases are necessary for providing electric service to our customers. The Distribution Transformer Blanket amount placed in rate base is the current year budget for meter equipment (meters, VTs, CTs).	These purchases are typically determined by the failure rate of existing transformers that need immediate replacement. Transformers are a necessary piece of equipment in order to provide electric service to customers. Specifically, these capital blanket work order expenditures are necessary because: 1. Deteriorated and failed transformer units must be replaced to maintain customer service. 2. The installation of new transformers will improve system efficiency and performance. New transformer purchases are based on a transformer purchase formula that evaluates total owning cost based on purchase price, no load loss (kW) and full load winding loss (kW) consistent with methodologies described in the Company's Integrated Resource Plan. 3. Transformer units will have to be replaced as part of voltage conversion projects due to different equipment ratings. All distribution transformers are purchased on the basis of a Transformer Loss Formula as required in the GMP Integrated Resource Plan, previously reviewed and approved by the PUC. This loss formula enables GMP to add transformers to its inventory that are the lowest life-cycle cost based on both the first cost of a given unit and the expected cost of demand and energy losses over the unit's life.
Transformers - Rate Period (Jan. - Sept. 2019)			
141720: Distribution Transformers Install	Project Type: Transformers In-Service Month: 3,6,9 In-Service Year: 2019 Primary Purpose: Reliability Secondary Purpose: Customer Service Priority: Required Total Project Spending: $2,705,726	This blanket covers purchases and installation of distribution line, pole and padmount transformers for the distribution system. These purchases are necessary for providing electric service to our customers. The Distribution Transformer Blanket amount placed in rate base is the current year budget for meter equipment (meters, VTs, CTs).	These purchases are typically determined by the failure rate of existing transformers that need immediate replacement. Transformers are a necessary piece of equipment in order to provide electric service to customers. Specifically, these capital blanket work order expenditures are necessary because: 1. Deteriorated and failed transformer units must be replaced to maintain customer service. 2. The installation of new transformers will improve system efficiency and performance. New transformer purchases are based on a transformer purchase formula that evaluates total owning cost based on purchase price, no load loss (kW) and full load winding loss (kW) consistent with methodologies described in the Company's Integrated Resource Plan. 3. Transformer units will have to be replaced as part of voltage conversion projects due to different equipment ratings. All distribution transformers are purchased on the basis of a Transformer Loss Formula as required in the GMP Integrated Resource Plan, previously reviewed and approved by the PUC. This loss formula enables GMP to add transformers to its inventory that are the lowest life-cycle cost based on both the first cost of a given unit and the expected cost of demand and energy losses over the unit's life.

Project Number and Title	Additional Information	Project Description	Project Justification
Transmission Lines - Interim Period (Oct. 2017 - Dec. 2018)			
153385: Little River TLine Bypass	Project Type: Transmission Lines In-Service Month: 10 In-Service Year: 2017 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Required Total Project Spending: $58,741	The primary driver for this project is reliability of the 34.5kV networked transmission system in the Middlesex and Waterbury area and local distribution load served out of the Little River Hydro facility. The 34.5 KV transmission line bypass is necessary to take the Little River Substation out of service for a planned hydro project while ensuring the reliability of the 34.5kV transmission system and local distribution load. This relocated transmission project will maintain the bypass to allow for an optimized configuration where the distribution load will be fed separately from the hydro station.	There is a station modernization project scheduled for Little River Hydro facility based on our FERC license requirements. The Hydro facility upgrade project requires the transmission line to be relocated for access into the hydro facility with cranes and large equipment. The local load is served off from the hydro facility generation bus. The hydro facility generation bus will be de-energized during the hydro facility project, requiring the distribution source to be removed from the hydro generation bus and served from the relocated transmission line.
153395: Pole RPLMNT-Johnson-Lowel L133	Project Type: Transmission Lines In-Service Month: 12 In-Service Year: 2017 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Recommended Total Project Spending: $119,210	Based upon an Engineering Line Rating study, structures needed to be replaced to achieve the required emergency line rating of 26 MVA. This emergency rating is needed for contingency situations occurring on the 115 kV transmission line, resulting in high flow on this 34.5 KV line. The majority of the structures requiring replacement are 1957 vintage. The initial intent of this study was to identify the necessary measures to increase the line's emergency capacity rating from 26MVA, its presumed existing Long Time Emergency (LTE) rating, to the 27MVA required to support the addition of a new nearby 5MW generator interconnection. After initial investigation, the study determined that the line in its current configuration cannot support the pre-project stated emergency rating of 26MVA.	The primary reason for this Project is reliability. The project is required at this time to achieve the required Long Time Emergency (LTE) rating of 26MVA.
154222: Underhill TL134 Tap Pole RPLMNT	Project Type: Transmission Lines In-Service Month: 1 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Recommended Total Project Spending: $786,920	This line is a radial 34.5kV transmission line serving the Underhill Substation, which does not have feeder backup. With no feeder back up for the distribution circuits, reliability of the transmission circuit is essential. This project will replace a number of aged poles on Line 134. The structure plant on this transmission line from structure 17 to structure 127 consists of 1955 vintage poles and associated hardware. The project includes replacing 106 structures and associated hardware.	The primary reason for this Project is reliability. The project timing is appropriate as the poles are more than 63 years old and are showing signs of deterioration. A past evaluation of 64-year-old transmission poles that were recently replaced indicated that transmission poles should be replaced before they reach 60 years of age. All of the 64-year-old poles inspected had significant rot and pole top deterioration. GMP will continue with a systematic replacement program to upgrade these transmission line assets. As the age profile of an asset gets older and the quantity of older assets increases, it is likely that unforeseen capital expenditures and reliability issues will increase if the poles are not replaced.
153396: Add MOAB L53 P105 Switch 325	Project Type: Transmission Lines In-Service Month: 4 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Recommended Total Project Spending: $90,618	This project will add SCADA control to an existing Motor Operated Air break (MOAB) on the normally open 325 switch between the radial 46kV line feeding the Rutland Gas Turbine and the networked 46kV line between Lalor Avenue Substation and Cold River Substation. Adding a SCADA-controlled motor to the existing Gang Operated Air Break switch with load break capability improves reliability and facilitates the ability to restore power to the Rutland Gas Turbine substation for an outage of the Lalor Avenue Substation, therefore minimizing outage times.	This project is part of an ongoing reliability improvement initiative with like in kind replacement of manually operated air break switches at critical sectionalizing points on the GMP subtransmission system with SCADA-controlled motor-operated load break switches. Motorizing these switches will significantly improve the operability and reliability of the system by facilitating remote fault isolation and sectionalization of the subtransmission system for disturbances and faults. Motorizing these switches increases worker safety by eliminating the need for workers to access the switch location and manually operate the switch. Presently, an outage to the Lalor Avenue substation results in the loss of the Rutland Gas Turbine and Lalor Avenue distribution substations, putting the area load at risk of not being able to use feeder backup. This affects hundreds of customers and one of our largest industrial customers as well as much of downtown Rutland. The installation would allow the Rutland Gas Turbine to be restored and increase the ability to utilize feeder backup to restore Lalor Avenue distribution load. Customers in these areas will see improved reliability as a result of this project.
131747: Tafstville L107 MOAB	Project Type: Transmission Lines In-Service Month: 6 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Recommended Total Project Spending: $449,154	The Woodstock Tap presently has a three-way Gang Operated Air Break (GOAB) switch installed on a 1971 structure that is deteriorating, with shell rot and woodpecker holes. This project replaces the three-way GOAB and its 1971 vintage structure with a SCADA-controlled Motor Operated Air Break (MOAB) on the Woodstock Tap 252 switch and two new GOAB switches (257 towards Woodstock and 251 towards Taftsville). The 252 MOAB with load break capability improves reliability to the Woodstock area by providing remote sectionalizing capability for over ten (10) miles of 46kV transmission line. The SCADA MOAB (252) will provide much faster restoration in the event of a fault on the 46 KV between East Barnard and Taftsville (Line 107) , allowing for sectionalizing of the fault and the ability to pick up Woodstock substation, therefore minimizing outage times for customers.	The primary justification for this project is Reliability. This project is part of an ongoing reliability improvement initiative with like in-kind replacement of manually operated air break switches at critical sectionalizing points on the GMP subtransmission system with SCADA-controlled motor-operated load break switches. Motorizing these switches will significantly improve the operability and reliability of the system by facilitating remote fault isolation and sectionalization of the subtransmission system for disturbances and faults. Motorizing these switches increases worker safety by eliminating the need for workers to access the switch location and manually operating the switch. Presently, an outage to Woodstock substation results in the loss of three distribution circuits (G81, G82 and G83). There are no feeder backup ties to other substation circuits for this substation. This impacts over 3,700 customers in a number of towns, including all of Woodstock Town and Woodstock Village. This project will improve reliability for the customers on these circuits.
153582: MOAB South Bennington 556 514	Project Type: Transmission Lines In-Service Month: 6 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Recommended Total Project Spending: $271,924	This project will add SCADA-controlled Motor Operated Air breaks (MOABs) on the South Bennington 556 and 514 switches. A Motor Operated Air Break (MOAB) with load break capability improves reliability and facilitates restoration by providing sectionalizing capability during contingencies. The installation would allow the line to be sectionalized under load remotely. It will allow for faster restoration in the event of a fault on the radial 46 KV between Woodford and Pownal (Line 7), allowing for sectionalizing of the fault and the ability to pick up South Bennington substation, therefore minimizing outage times for customers. Given that a distribution feeder backup tie exists between South Bennington and Pownal substations, Pownal customers could also see reliability benefits with this project.	This project is part of an ongoing reliability improvement initiative with like in kind replacement of manually operated air break switches at critical sectionalizing points on the GMP subtransmission system with SCADA-controlled motor-operated load break switches. Motorizing these switches will significantly improve the operability and reliability of the system by facilitating remote fault isolation and sectionalization of the subtransmission system for disturbances and faults. Motorizing these switches increases worker safety by eliminating the need for workers to access the switch location and manually operate the switch. Presently, an outage to South Bennington substation results in the loss of one distribution circuit (G40). This currently impacts 1,083 customers in the towns of Bennington and Pownal. An outage to the Pownal substation results in loss of two distribution circuits (G45 and G46). This currently impacts 1,505 customers fed in the towns of Bennington, Pownal and North Pownal. This project will improve reliability for the customers on these circuits.

Project Number and Title	Additional Information	Project Description	Project Justification
154806: Nason Street MOLB Bypass	Project Type: Transmission Lines In-Service Month: 6 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Recommended Total Project Spending: $200,804	This project will add 34.5 kV line bypasses at Nason Street to provide additional operational flexibility to reconfigure the 34.5 kV network in the St. Albans area as needed to maintain acceptable system performance. The project includes a bypass switch #767 across the Nason St B-3 and the Nason St B-16 at Nason St, which effectively ties the Welden B-26 circuit to the Nason B-3 circuit, and another bypass switch # 437 which will tie the end of the Ballard Rd B-24 circuit to the loop between Fairfax B-13 and Welden St B-13 at pole 234. This will create a new loop between Ballard Rd B-24 and Fairfax B-13, which will serve the Welden St bus via a 0.5 mile radial (between P234 and Welden St). Welden St B-11 will serve E St Albans as a radial feed while Welden St B-26 will serve N Elm St as a radial feed.	GMP had a bus fault at the Nason Street 34.5kV bus which resulted in the loss of a strong source into this area. After assessment, GMP decided installation of two switches on the existing 34.5kV transmission lines outside of Nason Street Substation would be provided needed voltage support for this contingency configuration. Therefore GMP decided to permanently install these bypass switches. The switches will be SCADA-control motor operated switches and will significantly improve the operability and reliability of the system by facilitating remote fault isolation and sectionalization of the subtransmission system for disturbances and faults. Motorizing these switches increases worker safety by eliminating the need for workers to access the switch location and manually operate the switch.
148600: Reconductor L37 (MST to Flor)	Project Type: Transmission Lines In-Service Month: 7 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Required Total Project Spending: $2,928,944	This project will rebuild approximately 7.2 miles of 46kV transmission line from Marble Street Substation to VELCO Florence Substation (Line 37) with 477 MCM ACSR conductor. The existing Proctor Tap vertical three-way GOAB (507, 508, & 509) will be replaced with three new MOLB switches (507, 508, & 509). These new switches will be SCADA controlled to improve system reliability. The larger conductor allows this radial feed to become part of the looped transmission system in the Rutland Area.	This project's justification is primarily reliability. This Project is part of the recommendations in the Rutland Reliability Plan submitted to the Public Utility Commission (PUC) in 2015. It was recommended after extensive loadflow analysis that the VMPD system could "ride through" a first contingency loss of its Florence 115/46 kV source, provided that the following system reinforcements were made: 1. Permanent closure of the normally open 46 kV B7 tie at West Rutland 2. Florence-West Rutland 46 kV line reconductoring (which includes the Marble Street-Florence segment) 3. Permanent closure of the normally open (2nd) Rutland-West Rutland 46 kV line with reconductoring These upgrades are required to improve the connectivity and consequent reliability of the former VMPD system that serves GMP's customers in Florence, Danby, and Proctor. Specifically, the existing Florence to West Rutland path could not carry the peak demand that it would have to carry, without reconductoring. Further analysis shows that the Rutland-area system also benefits substantially from the integration of VMPD, by effectively adding another 115/46 kV transformer in support of the area's 46 kV network (via Florence/West Rutland). This extra source improves area voltage and reduces loading on the area's other transformers, which could otherwise exceed their ratings post-contingency. Customers in the area will see improved reliability once this project is completed.
148599: Reconductor L39 (WRT to MST)	Project Type: Transmission Lines In-Service Month: 8 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Required Total Project Spending: $362,223	This project will rebuild approximately 0.56 miles of 46kV transmission line from Marble Street Substation to West Rutland Substation (Line 39) with 477 MCM ACSR conductor. A new MOLB switch (731) is also being installed to facilitate the upgrades proposed in the Marble Street Substation and for future maintenance of the Marble Street Substation. This SCADA-controlled switch allows the Danby load to be served out of the West Rutland Substation while the Marble Street Substation is out of service.	This project's justification is primarily reliability. This Project is part of the recommendations in the Rutland Reliability Plan submitted to the PSB in 2015. It was recommended after extensive loadflow analysis that the VMPD system could "ride through" a first contingency loss of its Florence 115/46 kV source, provided that the following system reinforcements were made: 1. Permanent closure of the normally open 46 kV B7 tie at West Rutland 2. Florence-West Rutland 46 kV line reconductoring (which includes the Marble Street-Florence segment) 3. Permanent closure of the normally open (2nd) Rutland-West Rutland 46 kV line with reconductoring. These upgrades are required to improve the connectivity and consequent reliability of the former VMPD system that serves GMP's customers in Florence, Danby, and Proctor. Specifically, the existing Florence to West Rutland path could not carry the peak demand that it would have to carry, without reconductoring. Further analysis shows that the Rutland-area system also benefits substantially from the integration of VMPD, by effectively adding another 115/46 kV transformer in support of the area's 46 kV network (via Florence/West Rutland). This extra source improves area voltage and reduces loading on the area's other transformers, which could otherwise exceed their ratings post-contingency. Customers in the area will see improved reliability once this project is completed.
148595: Cambridge Transmission L131	Project Type: Transmission Lines In-Service Month: 8 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Required Total Project Spending: $466,205	This project is primarily being completed for reliability, and is part of a larger initiative to upgrade an existing VEC 34.5 KV substation in Cambridge, VT. Specifically, this project provides a second tap line off an existing GMP owned 34.5 KV transmission line that feeds the VEC Cambridge substation. The Project proposes to install a transmission substation at the VEC Cambridge substation that will segment the existing transmission line from East Fairfax to Johnson into two transmission lines, one from East Fairfax to Cambridge and the other from Johnson to Cambridge. The conductor on the tap lines will be 477 ACSR. GMP will install a Motor Operated Load Break (MOLB) switch outside of the Cambridge substation to serve as a bypass for the substation to facilitate substation switching activities.	VEC has identified this Project in their Integrated Resource Plan to address asset management and safety issues. This substation structure has been identified as the worst on the VEC system. The structure is very congested; it is a hybrid wood/steel structure that has been modified several times over its life. This new tap line, with associated two new breakers, will automatically sectionalize GMP's B8 line so that if a fault occurs on one section of GMP's line, the new configuration will still allow energy to flow to VEC's substations while shutting off the faulted line. If the faulted line is east of the Cambridge substation, only the VEC Johnson substation would be without power; if the fault is west of the Cambridge substation, only the VEC Pleasant Valley and GMP Jeffersonville substation would be without power. If the fault is either east or west of the new Cambridge Substation, the VEC Cambridge Substation and Madonna Substation would not be without power. In other words, in any of these contingencies, thousands of customers who would without this Project have been affected, and lost power, will no longer experience an outage. The PUC approved this Project, the upgrade to and expansion of the existing Cambridge substation, in its order in Case No. 17-2675-PET dated September 26, 2017. GMP and VEC customers in this area will see improved reliability after this project is completed.
153540: 2018 WO 32 Transmission	Project Type: Transmission Lines In-Service Month: Monthly Oct-2017 - Sep-2018 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Required Total Project Spending: $1,361,245	Capital Blanket expenditures to replace or repair deteriorated or failed in equipment in transmission substations and transmission lines in order to maintain system capability and reliability. Typical projects in this blanket work order include, but are not limited to, replacement of equipment such as lightening arresters, batteries, breakers, transmission poles and insulators.	These projects are typically driven by unforeseen deteriorated or failed equipment and are needed immediately for proper system operation.

Project Number and Title	Additional Information	Project Description	Project Justification
153540: 2018-19 WO 32 Transmission	Project Type: Transmission Lines In-Service Month: Monthly Oct-2018 - Dec-2018 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Required Total Project Spending: $352,385	Capital Blanket expenditures to replace or repair deteriorated or failed in equipment in transmission substations and transmission lines in order to maintain system capability and reliability. Typical projects in this blanket work order include, but are not limited to, replacement of equipment such as lightening arresters, batteries, breakers, transmission poles and insulators.	These projects are typically driven by unforeseen deteriorated or failed equipment and are needed immediately for proper system operation.
159064: Marshfield Dam Electronics Project	Project Type: Transmission Lines In-Service Month: 11 In-Service Year: 2018 Primary Purpose: Safety Secondary Purpose: Operational Efficiency Priority: Required Total Project Spending: $48,556	This project is being done for safety and operational efficiency of the control system. The fiber optic cable system will allow GMP to install a remote terminal unit ("RTU") to monitor and control the gates at the dam. The fiber will facilitate new cameras being installed at the dam, allowing the Control Center personnel to view the status of the water and the dam.	GMP plant operators have been manually controlling the gates, which is not very efficient and presents significant safety risks to employees. It is also much more time intensive than remote operation of the facility, so adding remote capability is critical, especially in major storm events or high-water scenarios. This project will provide SCADA remote control to the site. It is appropriate to this project at this time because GMP now has, through the VELCO fiber network, the necessary infrastructure installed to allow SCADA communications to be improved and made more reliable. This work is part of a broader plan to improve the Marshfield Dam facilities to ensure their continued efficient and safe operation.
153593: MOAB Jeffersonville 191 & 436	Project Type: Transmission Lines In-Service Month: 12 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Recommended Total Project Spending: $215,293	This project will add SCADA-controlled Motor Operators to existing Gang Operated Air breaks with load break capability on the Jeffersonville 191 and 436 switches. A Motor Operated Air Break (MOAB) with load break capability improves reliability and facilitates restoration by providing sectionalizing capability during contingencies. The installation would allow the line to be sectionalized under load remotely. It will allow for faster restoration in the event of a fault on the 34.5 KV between East Fairfax and Johnson (Line 131), allowing for sectionalizing of the fault and the ability to pick up Jeffersonville substation, thereby minimizing outage times to customers.	The primary justification for this project is Reliability. This project is part of an ongoing reliability improvement initiative with like in kind replacement of manually operated air break switches at critical sectionalizing points on the GMP subtransmission system with SCADA-controlled motor-operated load break switches. Motorizing these switches will significantly improve the operability and reliability of the system by facilitating remote fault isolation and sectionalization of the subtransmission system for disturbances and faults. Motorizing these switches increases worker safety by eliminating the need for workers to access the switch location and manually operate the switch. Presently, an outage to the Jeffersonville substation results in the loss of one distribution circuit (G57). There are no feeder backup ties to other substation circuits for this substation, so an outage impacts 744 customers in the towns of Jeffersonville, Cambridge and Fletcher. This project will improve reliability for the customers on this circuit.
153750: Welden to NStAlbans TL135 P238-246 Recond	Project Type: Transmission Lines In-Service Month: 12 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Recommended Total Project Spending: $177,646	The proposed Project will reconductor the 34.5 kV subtransmission overhead line that runs from GMP's Welden Street substation to North St. Albans substation in St. Albans, Vermont. This segment is part of the 34.5 kV subtransmission loop that provides redundant transmission supply to the substations feeding the distribution system in the affected area. This line (Line 135) is 0.41 miles in length, and the existing 3/0 ACSR wire will be reconductored with the larger wire 477 ACSR.	This project is being done primarily for reliability. GMP engaged VELCO to complete a planning study in the St. Albans area. The study identified an existing overload of the Welden St - East St Albans 3/0 ACSR line segment of Line 135. The overload exceeded 10% of the line segment's thermal rating when the Nason Street end of the B10 line was opened for planned or emergency outages. This overload was also identified in VELCO's latest draft of the 2018 Long-Range Transmission Plan. An overload of the 3/0 ACSR can result in a hazard due to conductor sag and inadequate clearance or it can result in a complete burndown of the conductor, resulting in loss of customer load. The potential for this to occur warrants prompt remediation. This Project will increase reliability to GMP customers by preventing failure of the line for the identified contingency. The project also will remove the safety hazard of having a conductor sag creating inadequate clearance or burndown of the conductor.
135206: Riverside MOAB	Project Type: Transmission Lines In-Service Month: 12 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Recommended Total Project Spending: $209,177	This project will add SCADA controlled Motor Operators to existing Gang Operated Air breaks (GOAB) with load break capability on the Riverside 177 and 174 switches. Motor Operated Air Break (MOAB) with load break capability improves reliability and facilitates restoration by providing sectionalizing capability during contingencies. The installation would allow the line to be sectionalized under load remotely. It will allow for faster restoration in the event of a fault on the 46 KV line between Cavendish and South Street, allowing for sectionalizing of the fault and the ability to pick up Riverside substation, therefore minimizing outage times for customers. If the fault is between Riverside and South Street, this project will allow isolation of the fault and ability to restore the 46 kV transmission looped system.	The primary justification for this project is Reliability. This project is part of an ongoing reliability improvement initiative with like in kind replacement of manually operated air break switches at critical sectionalizing points on the GMP subtransmission system with SCADA-controlled motor operated load break switches. Motorizing these switches will significantly improve the operability and reliability of the system by facilitating remote fault isolation and sectionalization of the subtransmission system for disturbances and faults. Motorizing these switches increases worker safety by eliminating the need for workers to access the switch location and manually operating the switch. Presently, an outage to Riverside substation results in the loss of two distribution circuits (G66 and G68). This impacts over 2,000 customers in the towns of Ascutney, Chester, North Springfield, Springfield and Weathersfield. There are feeder backup ties to North Springfield and South Street, however, this Project will allow GMP to restore the 46 kV network from VELCO Ascutney to VELCO Cold River, in the event of a fault between South Street and Riverside. Operating the 46 kV system as a network versus a radial system improves the overall reliability. In the event one of the 115/46 kV sources is lost, the other 115/46 kV source could continue to feed all the substations fed off the network. Customers in these areas will see improved reliability as a result of this project.

Project Number and Title	Additional Information	Project Description	Project Justification
Transmission Lines - Rate Period (Jan. - Sept. 2019)			
148615: L107 Recond Bethel SS to P269	Project Type: Transmission Lines In-Service Month: 2 In-Service Year: 2019 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Recommended Total Project Spending: $167,348	This project will reconductor the Bethel to East Barnard (Line 107) to 477 ACSR conductor. This line is 6.3 miles in length; however, only a small portion of it (0.22 miles of 3/0 ACSR) will be reconductored because most of it is already thermally adequate (4/0 ACSR). Accordingly, 0.22 miles of 3/0 ACSR located at the Bethel end of the line will be replaced with 477 ACSR. This line is part of a 46kV transmission loop in the Middlebury, Windsor, and Chelsea areas.	This reconductoring project is an integral part of the planned VELCO Connecticut River Valley (CRVP) project. The reconductoring project is appropriate at this time because of the timing of the VELCO project and the ISO-NE studies. In the 248 process, under Docket 8605, the need for this GMP line upgrade was identified in the CRVP filing. The VELCO prefiled testimony stated "Related to these improvements, GMP will replace conductors for three 46 kV line sections: the East Middlebury to Smead Road line, the Bethel to East Barnard line and the Windsor to Taftsville line." The study indicated the existing Bethel to East Barnard 3/0 ACSR line section was overloaded by 115.7% of its thermal rating of 24.54 MVA. The PUC approved the VELCO CRVP, in its order in Docket No. 8605 dated June 9, 2016. GMP filed a separate petition requesting a certificate of public good October 31, 2017. The PUC approved this project, in its order Case No. 17-4777-PET dated March 29, 2018. The project will address the reliability concerns identified in the VELCO and ISO-NE studies.
153590: MOAB Thetford 926 & 927	Project Type: Transmission Lines In-Service Month: 2 In-Service Year: 2019 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Recommended Total Project Spending: $290,486	This project will add SCADA-controlled Motor Operated Air breaks (MOABs) on the Thetford 926 and 927 switches. A Motor Operated Air Break (MOAB) with load break capability improves reliability and facilitates restoration by providing sectionalizing capability during contingencies. The installation would allow the line to be sectionalized under load remotely. It will allow for faster restoration in the event of a fault on the 46 KV between Hartford and Bradford (Line 109), allowing for sectionalizing of the fault and the ability to pick up Thetford substation, therefore minimizing outage times for customers. If the fault occurs between Hartford and Thetford, the MOAB would allow for restoration of Bradford, Ely and Thetford substations.	The primary justification for this project is Reliability. This project is part of an ongoing reliability improvement initiative with like in kind replacement of manually operated air break switches at critical sectionalizing points on the GMP subtransmission system with SCADA-controlled motor-operated load break switches. Motorizing these switches will significantly improve the operability and reliability of the system by facilitating remote fault isolation and sectionalization of the subtransmission system for disturbances and faults. Motorizing these switches increases worker safety by eliminating the need for workers to access the switch location and manually operate the switch. Presently, an outage to Thetford substation results in the loss of one distribution circuit (G16). There are no feeder backup ties to other substation circuits for this substation. This impacts 1,100 customers in the towns of Thetford, Norwich and Strafford. An outage to the Bradford and Ely substations would impact an additional 2,842 customers. This project will improve reliability for the customers on these circuits.
148774: Evergreen Tap to WRutland L43 P1-20 RBLD & MOAB	Project Type: Transmission Lines In-Service Month: 5 In-Service Year: 2019 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Required Total Project Spending: $643,382	This project will rebuild approximately 0.94 miles of 46kV transmission line from Evergreen Tap to West Rutland Substation (Line 43) with 477 MCM ACSR conductor. The larger conductor on Line 43 allows this radial feed to become part of the looped transmission system in the Rutland Area. The existing Gang Operated Air Break (634) switch on Line 43 pole 1 is proposed to be replaced with a SCADA controlled Motor Operated Load Break (MOLB) switch, and two additional SCADA controlled MOLB switches will be installed, both to improve system reliability. Additionally, the existing Evergreen Tap to West Rutland (Line 43) transmission line is currently tapped off from the Lalor Avenue Substation to North Rutland Substation (Line 40) transmission line. The Line 43 transmission line will be removed from the Line 40 transmission line and placed on the Lalor Avenue Substation to North Rutland Substation (Line 41) transmission line. This provides looped 46 kV from Florence to North Rutland through Lalor Avenue.	This Project is part of the recommendations in the Rutland Reliability Plan submitted to the PSB in 2015. The Public Utility Commission (PUC) approved the Rutland Area Reliability Plan Upgrade, in its order in Docket No. 8867 dated May 25, 2017. It was recommended after extensive loadflow analysis that the VMPD system could "ride through" a first contingency loss of its Florence 115/46 kV source, provided that the following system reinforcements were made: 1. Permanent closure of the normally-open 46 kV B7 tie at West Rutland 2. Florence-West Rutland 46 kV line reconductoring (which includes the Marble Street-Florence segment) 3. Permanent closure of the normally open (2nd) Rutland-West Rutland 46 kV line with reconductoring These upgrades are required to improve the connectivity and consequent reliability of the former VMPD system that serves GMP's customers in Florence, Danby, and Proctor. Specifically, the existing Florence to West Rutland path could not carry the peak demand that it would have to, without reconductoring. Further analysis shows that the Rutland-area system also benefits substantially from the integration of VMPD, by effectively adding another 115/46 kV transformer in support of the area's 46 kV network (via Florence/West Rutland). This extra source improves area voltage and reduces loading on the area's other transformers, which could otherwise exceed their ratings post-contingency.
159729: MOAB Newbury 911 & 912	Project Type: Transmission Lines In-Service Month: 8 In-Service Year: 2019 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Recommended Total Project Spending: $385,270	The Newbury 911 and 912 switches are presently mounted on a two-way Gang Operated Air Break (GOAB) switch. This project replaces the existing GOAB with two SCADA-controlled Motor Operated Air breaks (MOABs) on the Newbury 911 and 912 switches. A Motor Operated Air Break (MOAB) with load break capability improves reliability and facilitates restoration by providing sectionalizing capability during contingencies. The installation would allow the line to be sectionalized under load remotely. It will allow for faster restoration in the event of a fault on the 46 KV between Ryegate and Bradford (Line 110), allowing for sectionalizing of the fault and the ability to pick up Newbury substation, therefore minimizing outage times to customers. If the fault occurred between Newbury and Bradford, the MOAB would allow the restoration of Wells River, Woodsville and Newbury substations.	The primary justification for this project is Reliability. This project is part of an ongoing reliability improvement initiative with like in kind replacement of manually operated air break switches at critical sectionalizing points on the GMP subtransmission system with SCADA-controlled motor-operated load break switches. Motorizing these switches will significantly improve the operability and reliability of the system by facilitating remote fault isolation and sectionalization of the subtransmission system for disturbances and faults. Motorizing these switches increases worker safety by eliminating the need for workers to access the switch location and manually operate the switch. Presently, an outage to Newbury substation results in the loss of one distribution circuit (G12). There are no feeder backup ties to other substation circuits for this substation. This impacts over 555 customers in the towns of Bradford and Newbury. As stated above, in the event of a fault between Newbury and Bradford, the customers fed off Wells River and Woodsville would also be impacted. This project will improve reliability for the customers on these circuits.
159747: Websterville TL Bypass	Project Type: Transmission Lines In-Service Month: 8 In-Service Year: 2019 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Recommended Total Project Spending: $302,525	This project is being completed in conjunction with a Websterville substation rebuild. A SCADA controlled Motor Operated Air break (MOAB) will be added to tie the Websterville to Barre 3306 line to the Websterville to McIndoes Falls 3311 line to maintain a 34.5 kV network while the Websterville substation is being upgraded. The Motor Operated Air Break (MOAB) with load break capability improves reliability and facilitates restoration by providing sectionalizing capability during contingencies. The installation would allow the line to be sectionalized under load remotely. It will allow for faster restoration in the event of a fault on the 34.5 KV between VELCO Barre and National Grid's McIndoes Falls substations. This bypass will be permanent and allow for additional operational flexibility to reconfigure the 34.5 KV network in the future as needed to optimize system conditions.	The primary justification for this project is Reliability. This project is necessary at this time because it is needed to maintain system reliability during the rebuild of the Websterville substation. The Project will allow for the continued networking of the subtransmission system. After assessment, GMP decided these configuration changes to support Websterville sub rebuild would be needed for planned or emergency situations, therefore decided to permanently install these bypass switches. The switches will be SCADA-controlled motor operated switches and will significantly improve the operability and reliability of the system by facilitating remote fault isolation and sectionalization of the subtransmission system for disturbances and faults. Motorizing a switch increases worker safety by eliminating the need for workers to access the switch location and manually operate the switch.

Project Number and Title	Additional Information	Project Description	Project Justification
159730: MOAB Castleton 274 & 275	Project Type: Transmission Lines In-Service Month: 9 In-Service Year: 2019 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Recommended Total Project Spending: $381,785	The Castleton 274 and 275 switches are presently mounted on a two-way Gang Operated Air Break (GOAB) switch. This project replaces the existing GOAB with two SCADA-controlled Motor Operated Air breaks (MOABs) on the Castleton 274 and 275 switches. A Motor Operated Air Break (MOAB) with load break capability improves reliability and facilitates restoration by providing sectionalizing capability during contingencies. The installation would allow the line to be sectionalized under load remotely. It will allow for faster restoration in the event of a fault on the 46 KV between West Rutland and Hydeville (Line 44) allowing for sectionalizing of the fault and the ability to pick up Castleton substation, therefore minimizing outage times for customers.	The primary justification for this project is Reliability. This project is part of an ongoing reliability improvement initiative with like in kind replacement of manually operated air break switches at critical sectionalizing points on the GMP subtransmission system with SCADA-controlled motor-operated load break switches. Motorizing these switches will significantly improve the operability and reliability of the system by facilitating remote fault isolation and sectionalization of the subtransmission system for disturbances and faults. Motorizing these switches increases worker safety by eliminating the need for workers to access the switch location and manually operate the switch. Presently, an outage to the Castleton substation results in the loss of one distribution circuits (G37). There are no feeder backup ties that can carry this circuit for all times of the year. This impacts over 930 customers in a number of towns, including a University campus. This project will improve reliability for the customers on these circuits.
153540: 2018-19 WO 32 Transmission	Project Type: Transmission Lines In-Service Month: Monthly Jan-2019 - Sep-2019 In-Service Year: 2019 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Required Total Project Spending: $1,057,157	Capital Blanket expenditures to replace or repair deteriorated or failed in equipment in transmission substations and transmission lines in order to maintain system capability and reliability. Typical projects in this blanket work order include, but are not limited to, replacement of equipment such as lightening arresters, batteries, breakers, transmission poles and insulators.	These projects are typically driven by unforeseen deteriorated or failed equipment and are needed immediately for proper system operation.
Transmission Substations - Interim Period (Oct. 2017 - Dec. 2018)			
153411: Velco Berlin X91 VT RPLMNT	Project Type: Transmission Substations In-Service Month: 11 In-Service Year: 2017 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Required Total Project Spending: $5,231	This project will replace a voltage transformer at the VELCO Berlin substation on the 34.5 kV. These voltage instrument transformers were installed in 1982 and have exceeded the manufacturer's life expectancy. GMP has experienced failures of this vintage and style of voltage instrument transformers. This equipment is used to provide voltage information to protective equipment, and the SCADA for remote indication.	The design life expectancy of this style of VTs is 40 years old per the manufacturer. GMP has had failures of this style of VT with the earliest failure occurring after 36 years of service. Accordingly, GMP has adopted a policy of replacing units 35 years and older to maintain safety and system reliability. The project timing is appropriate as the asset is more than 35 years old. Replacement will help prevent unplanned outages that might otherwise occur. This project will be a like in-kind replacement.
153412: Velco Cold Rv H31,H32 VT RPLMT	Project Type: Transmission Substations In-Service Month: 11 In-Service Year: 2017 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Required Total Project Spending: $15,747	This project will replace voltage transformers at the VELCO Cold River substation on the 46 kV. These voltage instrument transformers were installed in 1980 and have exceeded the manufacturer's life expectancy. GMP has experienced failures of this vintage and style of voltage instrument transformers. This equipment is used to provide voltage information to protective equipment, and the SCADA for remote indication.	The design life expectancy of this style of VTs is 40 years old per the manufacturer. GMP has had failures of this style of VT with the earliest failure occurring after 36 years of service. Accordingly, GMP has adopted a policy of replacing units 35 years and older to maintain safety and system reliability. The project timing is appropriate as the asset is more than 35 years old. Replacement will help prevent unplanned outages that might otherwise occur. This project will be a like in-kind replacement.
143582: Sand Road Bus Diff-Animal Miti	Project Type: Transmission Substations In-Service Month: 2 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Strategic Total Project Spending: $563,073	This Project will enhance relay protection schemes with the addition of bus differential relaying and breaker failure protection. Further reliability enhancements are afforded by this project with the addition of animal protection on the 34.5 kV bus, disconnect switches, breakers and 34.5/12.47 kV transformer. This substation is part of the network transmission system and also serves three distribution circuits, one 12.47 kV circuit and two 34.5 kV circuits. The distribution circuits out of this substation provide feeder ties to Essex and Tafts Corners circuits. The animal protection system protects substation assets and increases reliability by eliminating outages caused by animal contact. The engineering process takes into account the different approach an animal might take that ultimately leads to it making contact by either climbing or flying into the substation. The animal protection is form-fitted for its exact location and placed either on live parts or the ground to eliminate the difference of potential in locations where animal contact is most likely to occur.	This project accomplishes reliability improvement with improved local relay protection, remote relay protection and animal mitigation. All three of these strategies have shown increased reliability improvements including power quality improvements. As there is over 4 MW of customer load fed directly off this substation during peak times, and this substation is a backup for other area circuits for planned outages or contingencies, reliability at this location is of priority. Thousands of customers will benefit from these improvements. The Project will greatly reduce fault-clearing times, reducing the duration of the power quality event and add fault selectivity, interrupting the least amount of customers. In addition to generally improving reliability at this substation, this project will prevent animal contact issues in the substation, which can lead to equipment failure. GMP has experienced four (4) Chittenden County transmission (34.5 kV) substation outages due to animal contacts within the last two years. These outages have resulted in reliability and power quality impacts to customers as well as equipment damage and failure. This animal mitigation on the substation high-side (34.5 kV) equipment will increase reliability for customers fed from Sand Hill Road and potentially other area circuits that can be fed from this substation. Where similar animal protection has been installed in recent years, we have in many cases virtually eliminated animal-caused substation outages.
138419: HSCAT 3312 87L	Project Type: Transmission Substations In-Service Month: 6 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Strategic Total Project Spending: $39,141	This project is being done for reliability of the transmission system. This project consists of High-Speed relays and communication equipment at GMP Middlesex Substation and GMP Little River substation to provide high-speed clearing for faults on the 3312 line.	The project is designed to improve power quality by using a high-speed communications-aided tripping scheme (HSCAT) to reduce voltage dip duration during a fault. This allows sensitive electronic loads to ride through temporary system disturbances which otherwise would have caused the electronic loads to shut off or malfunction. Improving power quality is becoming more important as customer equipment is more sensitive to voltage dips. This project is possible at this time as GMP now has the necessary communications and relaying infrastructure installed to allow these schemes to be deployed. This project will improve reliability and power quality for the customers in this area.

Project Number and Title	Additional Information	Project Description	Project Justification
138422: HSCAT 3313 PUTT	Project Type: Transmission Substations In-Service Month: 6 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Strategic Total Project Spending: $58,646	This project is being done for reliability of the transmission system. This project consists of High-Speed relays and communication equipment at GMP Little River Substation and VELCO Stowe substation to provide high-speed clearing for faults on the 3313 line.	The project is designed to improve power quality by using a high-speed communications-aided tripping scheme (HSCAT) to reduce voltage dip duration during a fault. This allows sensitive electronic loads to ride through temporary system disturbances which otherwise would have caused the electronic loads to shut off or malfunction. Improving power quality is becoming more important as customer equipment is more sensitive to voltage dips. This project is possible at this time as GMP now has the necessary communications and relaying infrastructure installed to allow these schemes to be deployed. This project will improve reliability and power quality for the customers in this area.
138424: HSCAT 3306 PUTT	Project Type: Transmission Substations In-Service Month: 6 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Required Total Project Spending: $47,711	This project is being done for reliability of the transmission system. This project consists of High-Speed relays and communication equipment at GMP Websterville Substation and VELCO Barre substation to provide high-speed clearing for faults on the 3306 line.	The project is designed to improve power quality by using a high-speed communications-aided tripping scheme (HSCAT) to reduce voltage dip duration during a fault. This allows sensitive electronic loads to ride through temporary system disturbances, which otherwise would have caused the electronic loads to shut off or malfunction. Improving power quality is becoming more important as customer equipment is more sensitive to voltage dips. This project is possible at this time as GMP now has the necessary communications and relaying infrastructure installed to allow these schemes to be deployed. This project will improve reliability and power quality for the customers in this area.
143642: Chelsea Upgrade - VELCO CRVP	Project Type: Transmission Substations In-Service Month: 6 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Required Total Project Spending: $482,492	This project will replace the existing Chelsea 46kV H81 breaker. This is a single-tank, oil circuit breaker installed in 1970, making it 47 years old. Reliability concerns with the single tank oil circuit breaker have risen over the years due to internal faults, mainly during cold weather conditions. The 46kV breaker will be replaced with a vacuum type. A new relay/protection cabinet will be installed with modern multi-function microprocessor relays. All control wiring will be replaced. Other ancillary equipment that will be replaced including the dual bushing line voltage transformer, lightning arresters, and breaker disconnect switches.	GMP has experienced five failures with the same type of breaker as the Chelsea 46kV H81. In the last decade, these failures have been attributed to various reasons including internal tank faults, moisture ingress and bearing failures. In addition, this breaker is controlled by 1970 vintage electro-mechanical relays. The age and type of the relays makes them very difficult to maintain as they now fall out of calibration more easily and spare parts are no longer available. This Project includes the in-kind replacement of obsolete breaker and electromechanical relays. As part of the Connecticut River Valley Project (CRVP) VELCO will be upgrading their 115kV Chelsea substation. VELCO will be installing a temporary 115kV to 46kV configuration to allow the existing 115kV and 46kV yards to be taken out of service. While the existing 46kV yard is out of service, it is an opportune time for GMP to complete this project to address asset management upgrades. If not completed at this time, GMP would still need to utilize a portable transformer to perform the necessary upgrades. The installation of a portable can cost up to $20,000. In addition, the scheduling of overlapping outages for the VELCO and GMP work reduces the probability of suffering an unplanned contingency during the work, as compared with having two separate outages, which increases that exposure. This project will improve the reliability for this substation and customers it serves by proactively addressing asset management concerns. The PUC approved the VELCO CRVP, in its order in Docket No. 8605 dated June 9, 2016.
153386: Little River Sub Rebuild	Project Type: Transmission Substations In-Service Month: 6 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Required Total Project Spending: $989,302	The existing 34.5 kV transmission breakers 3312 and 3313 are single-tank oil circuit breakers and are over 50 years old. The 34.5 kV breakers will be replaced with vacuum types. Other ancillary equipment that will be replaced includes oil filled potential transformers (PTs), breaker disconnect switches and insulators that are 1954 vintage. GMP proposes to replace 1968 vintage VTs, all of which are 40 years old or more. The 1954 vintage breaker disconnects and bus support insulators are being replaced for reliability and safety. One of the main purposes of insulators is to support mechanical loading, whether it being static loading of bus work or dynamic loading of disconnect switches. Both the breaker disconnects and the bus support insulators are equipped with a style of insulator that is prone to age-related failure. These disconnect switches are being replaced because of this older insulator type. These switches are used during switching activities where the person doing switching exerts a force on the hook-operated disconnect to open it. GMP has experienced these devices breaking off during switching activities. For the safety of its workers, GMP replaces this type of switch during substation upgrades. The GOAB (1953 vintage) is being replaced for the same reasons as the breaker disconnect switches discussed above.	GMP has experienced catastrophic failures of the same style of breaker as the 3312 and 3313 breakers. These failures occurred at both the Ascutney and West Rutland substations. There have also been water ingress problems for this breaker type at the Fairfax and Woodford Road substations. The voltage instrument transformers (VT) are being replaced for safety and reliability. The design life expectancy of this style of VT is 40 years old per the manufacturer. GMP has had failures of this style of VT with the earliest failure occurring after 36 years of service. Accordingly, GMP has adopted a policy of replacing units 35 years and older to ensure safety and system reliability. There is a hydro generation station modernization project scheduled for Little River Hydro facility based on our FERC license requirements. Due to the proximity of the transmission substation to the proposed hydro generation station, the transmission substation will need to be out of service for safety concerns. This fact and the asset management concerns described previously, make this an opportune time for the transmission substation rebuild. Reliability at the Little River substation will be improved with in-kind replacement of obsolete breakers, VTs, Bus supports, switches and electromechanical relays, the style and vintage of which has caused reliability problems. With respect to the security system, GMP has experienced security incidents at similar facilities and is adding security cameras to substations. One past incident resulted in damages of $6,600 due to attempt to remove copper. Such incidents can result in danger to utility workers, the thieves, and the general public. Therefore, GMP is committed to increasing safety by the addition of security in substations. This project will improve reliability and safety for the Little River substation.
156453: Fairfax Sub Security	Project Type: Transmission Substations In-Service Month: 6 In-Service Year: 2018 Primary Purpose: Safety Secondary Purpose: Reliability Priority: Recommended Total Project Spending: $113,280	The primary reason for this project is to improve safety at the Fairfax substation and for customers served from it. This project is for the installation of a fence security system at the GMP Fairfax Substation in Fairfax, VT that serves two distribution circuits. The project is designed to improve safety with remote indication and recording of unauthorized entry into the substation.	This project is being done at this time to continue safety measures in GMP substations and is part of an ongoing effort to increase substation safety. This project is designed to reduce the risk of an unauthorized person entering the substation and reduce the risk of injury or death to that person.

Project Number and Title	Additional Information	Project Description	Project Justification
153119: McNeil Animal Mit/Brk Fail	Project Type: Transmission Substations In-Service Month: 7 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Required Total Project Spending: $356,582	This Project will enhance relay protection schemes with the addition of breaker failure relaying, and will enhance reliability with the addition of animal protection on the 34.5 kV bus, disconnect switches, breakers and 34.5/12.47 kV transformer in the GMP McNeil Substation. This substation is part of the network transmission system. The animal protection system protects substation assets and increases reliability by eliminating outages caused by animal contact. This engineering process takes into account the different approaches an animal might take that ultimately lead it to make contact by either climbing or flying into the substation. The animal protection is form fitted for its exact location and placed either on live parts or the ground plane to eliminate the difference of potential in locations where animal contact is most likely to occur.	This project accomplishes reliability improvement with improved local relay protection, remote relay protection and animal mitigation. All three of these strategies have shown increased reliability improvements including power quality improvements. The Project will greatly reduce fault clearing times, reducing the duration of the power quality event and add fault selectivity, interrupting the least amount of customers. In addition to generally improving reliability at this substation, this project will prevent animal contact issues in the substation, which can lead to equipment failure. GMP has experienced four (4) Chittenden County transmission (34.5 kV) substation outages due to animal contacts within the last two years. These outages have resulted in reliability and power quality impacts to customers as well as equipment damage and failure. This animal mitigation on the substation high-side (34.5 kV) equipment will increase reliability for customers fed from McNeil. In addition the McNeil generation is fed off this 34.5 kV bus and is one of the largest generators in Vermont in terms of capacity rating (over 50 MW). It produces more annual energy than any other Vermont generator. It is therefore intuitive that unnecessary outages at McNeil are undesirable from the perspective of system operations and net power costs for Vermont utilities. This project will increase reliability.
159335: Milton Sub Battery Upgrades	Project Type: Transmission Substations In-Service Month: 8 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Required Total Project Spending: $25,093	This project is a reliability and safety project to address asset management concerns with the existing station batteries at the GMP Milton substation. This Project is a like in-kind replacement.	This primary reason for this project is reliability issues with the current DC Battery system at the Milton Substation. The DC battery system must be maintained to the highest level reliability. Failure of a DC battery system is not tolerable and will result in critical systems not working properly, leading to safety issues. This project is appropriate at this time because the battery equipment is showing signs of deterioration; specifically, multiple posts are lifting to show where the jars are cracking, which is an indication that the battery should be replaced. Replacement will help prevent unplanned outages and safety issues that will occur if the battery system fails. Replacing this equipment will increase reliability.
159336: North St Albans Battery Upgrades	Project Type: Transmission Substations In-Service Month: 8 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Required Total Project Spending: $25,093	This project is a reliability and safety project to address asset management concerns with the existing station batteries at the GMP North St. Albans substation. This Project is a like in-kind replacement.	This primary reason for this project is reliability of the DC Battery system at the North St. Albans Substation. The DC battery system must be maintained to the highest level reliability. Failure of a DC battery system is not tolerable and will result in critical systems not working properly, leading to safety issues. This project is appropriate at this time because the battery equipment is showing signs of deterioration; specifically, multiple posts are lifting to show where the jars are cracking, which is an indication that the battery should be replaced. Replacement will help prevent unplanned outages and safety issues that will occur if the battery system fails. Replacing this equipment will increase reliability.
148598: Marble Street Bus Upgrade	Project Type: Transmission Substations In-Service Month: 9 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Required Total Project Spending: $315,072	The Marble Street strain-bus replacement is required to ensure a strain bus ampacity rating so that the two related conductor upgrades are not thermally limited or undercut by this intermediate strain-bus. The existing 4/0 ACSR strain bus will be replaced with 477 MCM ACSR. Further reliability enhancements are realized with the replacement of two gang operated air break (GOAB) switches with SCADA controlled motor operated load break (MOLB) switches (519 and 237). These upgrades are being done to allow the Marble Street Substation to become part of the Rutland Area networked 46kV transmission system. The substation will also be equipped with a new security system.	This project is driven by the planned projects identified in the Rutland Area Reliability Plan including the 46 kV Florence-Marble Street reconductoring and the 46 kV Marble Street-West Rutland reconductoring projects planned for 2018. To improve reliability, it is prudent to eliminate this weak point prior to the reconductoring work being completed. The PUC approved the Rutland Area Reliability Plan Upgrade, in its order in Docket No. 8867 dated May 25, 2017. The project improves reliability by replacing like in-kind equipment with higher ratings, and adding SCADA control to new switches with loadbreak capability (MOLB).
158431: Bethel Area Power Quality - Bethel Sub	Project Type: Transmission Substations In-Service Month: 9 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Customer Service Priority: Strategic Total Project Spending: $69,521	This project includes installation of a high-speed communications-aided tripping scheme (HSCAT) using high-speed relays and communication equipment GMP Bethel B25, B46 and B30 terminals providing high-speed clearing for the 46 kV Line.	A commercial customer was being adversely impacted by power quality issues and outages impacting the GMP Bethel substation. The project is designed to improve power quality by using a high-speed communications-aided tripping scheme (HSCAT) to reduce voltage dip duration during a fault. This allows sensitive electronic loads to ride through temporary system disturbances which otherwise would have caused the electronic loads to shut off or malfunction. The HSCAT scheme will result in all faults being cleared in 4 to 5 cycles, reducing the impact and improving the power quality for customers with sensitive electronic loads. Improving power quality is becoming more important as customer equipment is more sensitive to voltage dips. This project is possible at this time as GMP now has the necessary communications and relaying infrastructure installed to allow these schemes to be deployed. The Bethel substation feeds the BE-G29 circuit, which is one of GMP's 20 worst performing circuits according to the number of customers affected by outages and the number of customer hours-out. This project will improve the reliability for this circuit by reducing impacts of temporary system disturbances.
158435: Bethel Area Power Quality - East Barnard Sub	Project Type: Transmission Substations In-Service Month: 9 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Customer Service Priority: Strategic Total Project Spending: $17,502	This project includes installation of a Direct transfer Trip (DTT) scheme using high-speed relays and communication equipment between the GMP East Barnard B38 and the Bethel B25. When a fault impacts the B38, feeding to Sharon Substation, it will send a trip command to the Bethel B25.	A commercial customer was being adversely impacted by power quality issues and outages impacting the GMP Bethel substation. The project is designed to improve power quality by using a high-speed communications-aided tripping scheme (HSCAT) to reduce voltage dip duration during a fault. This allows sensitive electronic loads to ride through temporary system disturbances which otherwise would have caused the electronic loads to shut off or malfunction. The HSCAT scheme will result in all faults being cleared in 4 to 5 cycles, reducing the impact and improving the power quality for customers with sensitive electronic loads. Improving power quality is becoming more important as customer equipment is more sensitive to voltage dips. This project is possible at this time as GMP now has the necessary communications and relaying infrastructure installed to allow these schemes to be deployed. The Bethel substation feeds the BE-G29 circuit, which is one of GMP's 20 worst performing circuits according to number of customers affected by outages and the number of customer hours-out. This project will improve the reliability for this circuit by reducing impacts of temporary system disturbances.

Project Number and Title	Additional Information	Project Description	Project Justification
158439: Bethel Area Power Quality - Smead Rd Sub	Project Type: Transmission Substations In-Service Month: 9 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Customer Service Priority: Strategic Total Project Spending: $17,743	This project includes installation of a high-speed communications-aided tripping scheme (HSCAT) using high-speed relays and communication equipment at the GMP Smead Road B36 terminal to provide high-speed clearing for the 46 kV Lines between the Smead Road and Bethel substations.	A commercial customer was being adversely impacted by power quality issues and outages impacting the GMP Bethel substation. The project is designed to improve power quality by using a high-speed communications-aided tripping scheme (HSCAT) to reduce voltage dips duration during a fault. This allows sensitive electronic loads to ride through temporary system disturbances, which otherwise would have caused the electronic loads to shut off or malfunction. The HSCAT scheme will result in all faults being cleared in 4 to 5 cycles, reducing the impact and improving the power quality for customers with sensitive electronic loads. Improving power quality is becoming more important as customer equipment is more sensitive to voltage dips. This project is possible at this time as GMP now has the necessary communications and relaying infrastructure installed to allow these schemes to be deployed. The Bethel substation feeds the BE-G29 circuit, which is one of GMP's 20 worst performing circuits according to number of customers affected by outages and the number of customer hours-out. This project will improve the reliability for this circuit by reducing impacts of temporary system disturbances.
158436: Bethel Area Power Quality - Taftsville Sub	Project Type: Transmission Substations In-Service Month: 10 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Customer Service Priority: Strategic Total Project Spending: $17,743	This project includes installation of a high-speed communications-aided tripping scheme (HSCAT) using high speed relays and communication equipment at GMP Taftsville B25 terminal to provide high-speed clearing for the 46 kV lines between Taftsville and Bethel.	A commercial customer was being adversely impacted by power quality issues and outages impacting the GMP Bethel substation. The project is designed to improve power quality by using a high-speed communications-aided tripping scheme (HSCAT) to reduce voltage dips duration during a fault. This allows sensitive electronic loads to ride through temporary system disturbances which otherwise would have caused the electronic loads to shut off or malfunction. The HSCAT scheme will result in all faults being cleared in 4 to 5 cycles reducing the impact and improving the power quality for customers with sensitive electronic loads. Improving power quality is becoming more important as customer equipment is more sensitive to voltage dips. This project is possible at this time as GMP now has the necessary communications and relaying infrastructure installed to allow these schemes to be deployed. The Bethel substation feeds the BE-G29 circuit, which is one of GMP's 20 worst performing circuits according to number of customers affected by outages and the number of customer hours-out. This project will improve the reliability for this circuit by reducing impacts of temporary system disturbances.
158438: Bethel Area Power Quality - Chelsea Sub	Project Type: Transmission Substations In-Service Month: 10 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Customer Service Priority: Strategic Total Project Spending: $19,055	This project includes installation of a high-speed communications-aided tripping scheme (HSCAT) using high speed relays and communication equipment at VELCO Chelsea H81 terminal to provide high-speed clearing for the 46 kV lines between VELCO Chelsea and GMP Bethel substations.	A commercial customer was being adversely impacted by power quality issues and outages impacting the GMP Bethel substation. The project is designed to improve power quality by using a high-speed communications-aided tripping scheme (HSCAT) to reduce voltage dip duration during a fault. This allows sensitive electronic loads to ride through temporary system disturbances which otherwise would have caused the electronic loads to shut off or malfunction. The HSCAT scheme will result in all faults being cleared in 4 to 5 cycles, reducing the impact and improving the power quality for customers with sensitive electronic loads. Improving power quality is becoming more important as customer equipment is more sensitive to voltage dips. This project is possible at this time as GMP now has the necessary communications and relaying infrastructure installed to allow these schemes to be deployed. The Bethel substation feeds the BE-G29 circuit, which is one of GMP's 20 worst performing circuits according to number of customers affected by outages and the number of customer hours-out. This project will improve the reliability for this circuit by reducing impacts of temporary system disturbances.
148627: Rawsonville RTU Replacement	Project Type: Transmission Substations In-Service Month: 11 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Recommended Total Project Spending: $80,877	The GMP Rawsonville substation remote terminal unit (RTU) will be replaced. This RTU is 1980 vintage electronic technology which is no longer supported by the vendor. Furthermore, the RTU communicates with the master SCADA front end processor (FEP) located in the Systems Operations Headquarters. The FEP is a server of the same vintage as the RTU which is also no longer supported	This project is appropriate at this time to address reliability concerns associated with an RTU. This project is part of GMP's plan for an orderly replacement of 1980 vintage unsupported RTUs with few spare parts available. Failure of the SCADA FEP will result in loss of SCADA to as many as twenty facilities. The FEPs cannot be replaced until all RTUs have been upgraded. In an effort to migrate from the vintage unsupported technology, GMP is planning to replace RTUs over a five-year period, allowing the migration to new technology utilizing digital communication between the master station and field devices. Reliability is being improved with replacement of like in-kind remote terminal units. The new remote terminal units are microprocessor base and interface with the modern SCADA master system.
148592: Cambridge Substation	Project Type: Transmission Substations In-Service Month: 12 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Required Total Project Spending: $1,138,890	This project is primarily being completed for reliability and will upgrade an existing Vermont Electric Cooperative (VEC) 34.5 KV substation in Cambridge, VT. VEC and GMP worked on a joint-owned station design/concept that would include GMP-owned in and out transmission line breakers. These transmission breakers greatly improve reliability to the five distribution substations fed off from this 14-mile subtransmission line by reducing their exposure to line faults by 50%. The two new breakers will automatically sectionalize GMP's B8 line so that if a fault occurs on one section of GMP's line, the new configuration will still allow energy to flow to VEC's substations while shutting off the faulted line. If the faulted line is east of the Cambridge substation, only the VEC Johnson substation would be without power; if the fault is west of the Cambridge substation, only the VEC Pleasant Valley and GMP Jeffersonville substation would be without power. If the fault is either east or west of the new Cambridge Substation, the VEC Cambridge Substation and Madonna Substation would not be without power.	VEC had identified this Project in their Integrated Resource Plan to address asset management and safety issues; it was identified as the worst on the VEC system. The structure is very congested; it is a hybrid wood/steel structure that has been modified several times over its life. This VEC substation is fed from a GMP-owned 34.5 kV transmission line. As supported in the Vermont Electric Plan, GMP and VEC coordinated this project to develop cost-effective system upgrades that would benefit both utilities' customers. The project improves reliability with replacement of like in-kind equipment for asset management as well as installation of new 34.5kV circuit breakers and associated assets to create discrete zones of protection. Discrete zones of protection minimize the number of customers affected by a line outage.

Project Number and Title	Additional Information	Project Description	Project Justification
148608: West Rutland Xmission Upgrade	Project Type: Transmission Substations In-Service Month: 12 In-Service Year: 2018 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Required Total Project Spending: $1,168,538	The upgrades at the West Rutland Transmission Substation consist of adding two (2) 46kV transmission breakers (B-4 and B-5). The two existing 1969 vintage OCBs (B-7 and B-56) will be 49 years old when replaced. GMP has had failures of this style and vintage of breakers. The bus and line instrument transformers are being replaced as they have reached their limit for useful life. The new breakers will be Vacuum Circuit Breakers (VCB). The substation will be equipped with a new security system.	The project improves reliability with like in-kind replacement of obsolete equipment such as breakers and instrument transformers, the style and vintage of which has caused reliability problems. Additional reliability enhancements are being realized with the installation of new 46kV breakers to enable the 46kV system to be networked rather than radial. This Project is part of the recommendations in the Rutland Reliability Plan submitted to the Public Utility Commission (PUC) in 2015. The PUC approved the Rutland Area Reliability Plan Upgrade in its order in Docket No. 8867 dated May 25, 2017. It was recommended after extensive loadflow analysis that the VMPD system could "ride through" a first contingency loss of its Florence 115/46 kV source, provided that the following system reinforcements were made: 1. Permanent closure of the normally open 46 kV B7 tie at West Rutland 2. Florence-West Rutland 46 kV line reconductoring (which includes the Marble Street-Florence segment) 3. Permanent closure of the normally open (2nd) Rutland-West Rutland 46 kV line with reconductoring These upgrades are required to improve the connectivity and consequent reliability of the former Vermont Marble Power Division (VMPD) system that serves GMP's customers in Florence, Danby, and Proctor, including a large industrial customer. Specifically, the existing Florence to West Rutland path could not carry the peak demand that it would have to, without reconductoring. Further analysis shows that the Rutland area system also benefits substantially from the integration of VMPD, by effectively adding another 115/46 kV transformer in support of the area's 46 kV network (via Florence/West Rutland). This extra source improves area voltage and reduces loading on the area's other transformers, which could otherwise exceed their ratings post-contingency.
Transmission Substations - Rate Period (Jan. - Sept. 2019)			
159716: North Springfield PT Upgrade	Project Type: Transmission Substations In-Service Month: 5 In-Service Year: 2019 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Recommended Total Project Spending: $36,201	This project will replace voltage transformers at the North Springfield substation on the 46 kV line. These voltage instrument transformers were installed in 1970 and have exceeded the manufacturer's life expectancy. GMP has experienced failures of this vintage and style of voltage instrument transformers. This equipment is used to provide voltage information to protective equipment, and the SCADA for remote indication.	The design life expectancy of this style of VT is 40 years old per the manufacturer. GMP has had failures of this style of VT with the earliest failure occurring after 36 years of service. Accordingly, GMP has adopted a policy of replacing units 35 years and older to maintain safety and system reliability. The project timing is appropriate as the asset is more than 35 years old. Replacement will help prevent unplanned outages that might otherwise occur. This project will be a like in-kind replacement.
159717: Bethel Sub PT Upgrade	Project Type: Transmission Substations In-Service Month: 5 In-Service Year: 2019 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Recommended Total Project Spending: $35,952	This project will replace voltage transformers at the Bethel substation on the 46 kV. These voltage instrument transformers were installed in 1977 and have exceeded the manufacturer's life expectancy. GMP has experienced failures of this vintage and style of voltage instrument transformers. This equipment is used to provide voltage information to protective equipment, and the SCADA for remote indication.	The design life expectancy of this style of VT is 40 years old per the manufacturer. GMP has had failures of this style of VT with the earliest failure occurring after 36 years of service. Accordingly, GMP has adopted a policy of replacing units 35 years and older to maintain safety and system reliability. The project timing is appropriate as the asset is more than 35 years old. Replacement will help prevent unplanned outages that might otherwise occur. This project will be a like in-kind replacement.
159719: Rawsonville PT Upgrade	Project Type: Transmission Substations In-Service Month: 6 In-Service Year: 2019 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Recommended Total Project Spending: $135,479	This project will replace voltage transformers at the Rawsonville substation on the 46 kV. These voltage instrument transformers were installed in 1970 and have exceeded the manufacturer's life expectancy. GMP has experienced failures of this vintage and style of voltage instrument transformers. This equipment is used to provide voltage information to protective equipment, and the SCADA for remote indication.	The design life expectancy of this style of VT is 40 years old per the manufacturer. GMP has had failures of this style of VT with the earliest failure occurring after 36 years of service. Accordingly, GMP has adopted a policy of replacing units 35 years and older to maintain safety and system reliability. The project timing is appropriate as the asset is more than 35 years old. Replacement will help prevent unplanned outages that might otherwise occur. This project will be a like in-kind replacement.
159727: Manchester Trans Sub PT Upgrade	Project Type: Transmission Substations In-Service Month: 8 In-Service Year: 2019 Primary Purpose: Reliability Secondary Purpose: Safety Priority: Recommended Total Project Spending: $140,614	This project will replace voltage transformers at the Manchester Transmission substation on the 46 kV. These voltage instrument transformers were installed in 1968 and have exceeded the manufacturer's life expectancy. GMP has experienced failures of this vintage and style of voltage instrument transformers. This equipment is used to provide voltage information to protective equipment, and the SCADA for remote indication.	The design life expectancy of this style of VT is 40 years old per the manufacturer. GMP has had failures of this style of VT with the earliest failure occurring after 36 years of service. Accordingly, GMP has adopted a policy of replacing units 35 years and older to maintain safety and system reliability. The project timing is appropriate as the asset is more than 35 years old. Replacement will help prevent unplanned outages that might otherwise occur. This project will be a like in-kind replacement.