

**UNITED STATES OF AMERICA
BEFORE THE FEDERAL ENERGY REGULATORY COMMISSION**

DRAFT APPLICATION FOR NEW LICENSE FOR MAJOR PROJECT – EXISTING DAM

BLenheim-GILBOA PUMPED STORAGE POWER PROJECT

FERC PROJECT No. 2685

**EXHIBIT H
INFORMATION REQUIRED UNDER 18 CFR § 16.10**

December 2016

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**NY Power
Authority**

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1 Information to be Supplied by All Applicants (18 CFR Section 16.10 (a))

The Federal Power Act requires applicants for a new license to provide certain information about the applicant's record as the current licensee of the project. Pursuant to 18 CFR § 16.10, this information is provided in this Exhibit. 18 CFR § 16.10(a) information requirements include the need for Blenheim-Gilboa Pumped Storage Power Project (Project, B-G Project) power and the examination of alternative sources; plans to modify an existing Project; an applicant's ability to operate and maintain the Project; and the applicant's electrical efficiency programs. This information is included in Section 1.0 of this Exhibit. Pursuant to 18 CFR § 16.10(b), Section 2.0 contains information to be provided by an applicant who is the existing licensee for a Project and discusses the Power Authority's safe management, operation, and maintenance of the Project; operational history and programs to upgrade Project operation and maintenance; compliance with the current license; and actions related to the Project that affect the public.

1.1 Plans and Ability of the Power Authority to Operate the Project (18 CFR Section 16(a)(1))

As discussed in Exhibit B, the Power Authority has no current plans to increase capacity or generation at the Project.

Inflow to the Project includes runoff from the small intervening watershed of about 40 sq. mi. between the New York City Department of Environmental Protection's (NYCDEP) Gilboa Dam located approximately 5 miles upstream and the Project including the Mine Kill and Platter Kill. Except during the spring freshet or during floods when water is spilled, Gilboa Dam diverts runoff from 316 sq. mi. of the Schoharie Creek watershed for the New York City water supply system.

The Project is operated so that outflow generally equals inflow except for small amounts needed to replenish whatever water is depleted from the system by means of evaporation and minor seepage losses. NYCDEP's operation of Gilboa Dam does not affect the pumping and generating schedule of the B-G Project.

The Power Authority coordinates operation of the Project with other electrical systems through its participation in the markets operated by the New York Independent System Operator (NYISO). The Project is a critical resource used by the Power Authority to meet its statutory and contractual obligations to its customers and provides cost saving benefits to the statewide grid and consumers. As discussed in Exhibit B, Section 2.3.1, the Project cycles water between two reservoirs (Upper, Lower). During periods of low demand for electricity and lower electricity prices, water is pumped from the Lower Reservoir to the Upper Reservoir. During periods of peak demand for electricity, water is released from the Upper Reservoir to the Lower Reservoir through the turbines to generate electricity.

The B-G Project is operated to serve these purposes: to provide power at times of high consumer use, and to be available in a reserve mode to respond to an unanticipated loss of elements of the electric system.

The New York electric grid is expected to require greater flexibility in the future to operate reliably given expected future changes such as increasing variability and uncertainty associated with larger installations of wind and solar generation. Pumped storage facilities such as the B-G Project have the technical capabilities that closely match the power system's growing need for flexibility. The B-G Project can be used

effectively to serve some of the electricity storage needed to provide a consistent and reliable grid based increasingly on renewable sources.

Another significant contribution of pumped storage facilities is the ability to contribute to the more efficient use of the fossil-fueled and nuclear generation fleets. Traditional power plants such as coal-fired and nuclear plants operate more efficiently when they are maintained at a steady level of electrical output and are not subject to adjustments for constantly changing loads (i.e., cycling). Pumped storage facilities are capable of significant flexibility in operations, such that they can be used to increase load in the off-peak hours by drawing electricity for pumping water to the upper reservoir when thermal units might otherwise need to reduce generation or be shut off. Reducing the need for thermal plant cycling results in much more efficient operations, which lowers overall emissions from fuel consumption.

1.2 Power Authority's Need for the Electricity Generated by the Project (18 CFR Section 16(a)(2))

The sale of power from the Project is governed by provisions of New York State law relating to the marketing of hydroelectric power, specifically Article 5, Title 1 of the Public Authorities Law, which is known as the "Power Authority Act." The Power Authority markets and operates the Project to meet the marketing plan established pursuant to the Power Authority Act and the specific license conditions and operating characteristics of the Project.

The B-G Project also plays an important role in New York's renewable energy portfolio because it provides low-cost energy and stores water for power production during periods of peak energy demand. When needed, the B-G Project can provide "black start" capability to restart other Power Authority facilities and, eventually, the statewide energy grid. The B-G Project can generate power within several minutes when other facilities within the NYISO are shut down. The B-G Project also provides the ancillary services of regulation reserve and voltage support to the statewide power system. If power from the B-G Project were not available, these services would need to be provided to the NYISO from other generation sources, whether existing or new.

Alternative sources of power could be obtained by purchasing power from one or more of the electricity markets operated by the NYISO, the New England Independent System Operator (ISO), or the PJM Interconnection. Power could also be supplied through the construction of new power plants or by executing bilateral contracts at negotiated rates with market participants.

Because the B-G Project typically operates at times of highest demand, the reasonable cost of available power would typically be the highest prices paid in the NYISO's Capital Load Zone. As further explained in Exhibit D this value could be as high as \$138/MWh (February 2015) but is typically more in the \$30-40/MWh range.

The Socioeconomic Report ([NYPA 2016](#)) quantified the direct benefit of the B-G Project for reducing energy and capacity prices in New York. The benefit of reducing operating reserve costs was determined through statistical analysis. The benefits were quantified by comparing two scenarios: one considering the B-G Project's continued operation, and one hypothetically assuming its absence (i.e., the No Project scenario).

Overall, the net present value (NPV) of the benefits from the continued operation of the B-G Project in terms of expected savings to consumers through reduction in wholesale electricity prices, capacity, and ancillary markets is \$6.6 billion dollars (i.e., \$493 million per year between 2019 and 2060). [Table 1.2-1](#) shows the

differences between the two scenarios as the effect on the market costs that consumers will pay for energy products in the future with the B-G Project and without it.

As shown in [Table 1.2-1](#), the B-G Project is projected to reduce total electric energy costs in the wholesale markets by \$62 million on a present-value basis from 2019 through 2060. Furthermore, the capacity costs to New York consumers (and consequently overall electric energy costs) are projected to be \$6.5 billion dollars less on a present-value basis for the 2019 to 2060 time period. The B-G Project also benefits the ancillary markets. Only operating reserves were considered to evaluate the effect on the ancillary markets, even though the facility also provides voltage support and black start services. The operating reserve costs for 2019 to 2060 are projected to be reduced by \$33 million on a present-value basis.

These estimates represent the value of the services provided by the B-G Project, not specific revenue to be derived from future operations.

**Table 1.2-1: Summary of the B-G’s Project Value to Consumers
in the New York Power Market**

Market Type	NPV of Effect on Power Market Costs, 2019 – 2060*
Wholesale Energy	-\$61,979,000
Capacity	-\$6,534,434,000
Ancillary Services	-\$33,246,000
Total	-\$6,629,659,000
Total Annualized Basis	-\$492,822,000

*NPV= net present value; assumes a 7 percent discount rate.

Source: [NYPA 2016](#)

In addition to affecting the wholesale markets (i.e., energy, capacity, and ancillary services), the B-G Project also reduces retail rates for electricity. Retail rates are driven not only by wholesale power prices, but also by the cost of the transmission and distribution system and other utility expenses. The analysis in the Socioeconomics Report ([NYPA 2016](#)) shows that the continued operation of the B-G Project is projected to reduce annual costs to typical residential customers throughout New York State (assuming an average monthly consumption of 1,000 kilowatt-hours) by an average of \$65 per household in year 2020. Overall, the Project is estimated to provide savings to all customers, residential, commercial and industrial, of \$809 million in 2020.

Savings under the B-G Project are high until 2030 because the hypothetical No Project scenario assumes that new power projects would be constructed during this time frame to replace the generation of the B-G Project. The cost of the new projects would be passed onto customers in the form of higher electricity bills. On the other hand, the continued operation of the B-G Project would not require such investments, and are thus savings to the customers. Beyond 2030, there are no new power plants in the No Project scenario, but the residual effect of the new capacity results in a comparatively lower savings under the B-G Project scenario. [Table 1.2-2](#) provides detail on the effect of reduced retail electric rates statewide as the result of the B-G Project’s continued operation.

Table 1.2-2: Estimated Annual Savings on Electricity Bills by Customer Class for New York State with the B-G Project's Continued Operation

	2020	2030	2040	2050	2060
Average Annual Typical Residential Bill Savings (\$ per year)	\$64.53	\$36.26	\$13.32	\$0.53	\$1.86
Total Savings, All Residential Customers (\$ million)	\$291.29	\$163.99	\$59.57	\$2.33	\$8.15
Total Savings, All Commercial Customers (\$ million)	\$436.93	\$245.99	\$89.36	\$3.49	\$12.22
Total Savings, All Industrial Customers (\$ million)	\$80.91	\$45.55	\$16.55	\$0.65	\$2.26
Total Savings, All Customers (\$ million)	\$809.13	\$455.53	\$165.48	\$6.46	\$22.63

Source: [NYPA 2016](#)

Should the B-G Project not receive a license, various benefits to the economy resulting from operation of the Project would be lost. The analysis presented in the Socioeconomic Report ([NYPA 2016](#)) shows that the B-G Project has a significant positive effect on the economy in terms of jobs, income, GRP, and population. The positive effects are a result of the employment, expenditures, and of the electricity bill savings to the state's customers attributable to the B-G Project. The B-G Project provides significant socioeconomic benefits not only to residents of Schoharie County communities and in the B-G Region, but also to all state residents because it contributes to maintaining a reliable grid and to ensuring that electricity prices remain affordable for all residents.

Additional discussion of the socioeconomic benefits of the B-G Project is included in Exhibit E of this application.

1.3 Need for Project Power, Reasonable Cost, and Availability of Alternative Sources of Power (18 CFR Section 16(a)(3))

The average annual costs of the power produced by the B-G Project includes capital costs, operating costs (the costs of purchased power and related expenses, fuel consumed, operation and maintenance, and administrative expenses), and costs associated with the B-G Project relicensing, including proposed Protection, Mitigation, and Enhancement measures. As described in Exhibit D, the Power Authority has conducted an analysis of the costs of producing project power.

The Average Annual Cost of Power Produced by the Blenheim-Gilboa Pumped Storage Power Project data is currently under development and will be provided upon submission of the final license application.

The B-G Project operates primarily in response to NYISO demands for the benefit of all New York customers. The NYISO monitors, evaluates, and responds to statewide fluctuations in supply and demand in real time.

The average annual cost of the power produced by the Project is provided in Exhibit D. The Socioeconomics Report ([NYPA 2016](#)) indicates that three new natural gas-fired power plants would need to be built during the period 2024 through 2030 to replace the capacity of the B-G Project. The capacities and on-line years

presented in [Table 1.3-1](#) reflect the results of the hypothetical No Project scenario.

Table 1.3-1: Incremental New Gas Capacity (MW) Necessary without the B-G Project

	2024	2029	2030
Schoharie County	0	0	0
B-G Region, excluding Schoharie County	0	0	0
Rest of New York	200	400	550

Source: [NYPA 2016](#)

An alternative source provider would either have sufficient existing resources to meet the needs of its customers including the current Project customers, would construct additional capacity to meet these requirements, or would secure resources from the wholesale market.

1.4 Use of Project Power for Power Authority-Owned Industrial Facility (18 CFR Section 16(a)(4))

The Power Authority does not use B-G Project power for its own industrial facility or related operations; therefore, this section is not applicable to the Power Authority's relicensing application for the B-G Project.

1.5 Need for Power if Applicant is an Indian Tribe (18 CFR Section 16(a)(5))

The Power Authority is not an Indian Tribe applying for a license located on a tribal reservation; therefore, this section is not applicable to the Power Authority's relicensing application for the B-G Project.

1.6 Impact on Power Authority's Transmission System with/without Receipt of New License (18 CFR Section 16(a)(6))

The continued flow of Project-generated energy will not impact the Power Authority's transmission system. Because the Power Authority has no plans to increase the installed capacity of the Project, the current interconnections and related transmission facilities are capable of handling the maximum output of the Project. No upgrade of Project interconnections or related transmission facilities will be required. The single line diagram for the Project is provided in Figure 1

Should the B-G Project not receive a new license, the Project's "black start" capability, which can be used to restart other Power Authority facilities, as well as the statewide energy grid, will be lost. The B-G Project also provides the ancillary services of regulation reserve and voltage support to the statewide power system. If power from the B-G Project were not available, these services would need to be provided to the NYISO from other generation sources, whether existing or new. The Project's contribution to the grid's ability to accommodate a variable supply from renewable generators such as wind and solar will also be lost. Further, efficiencies at fossil-fuel and nuclear stations realized by the Project's operations will also be lost.

1.7 Plan to Modify the Project (18 CFR Section 16(a)(7))

The Power Authority has no plans to construct new facilities or to alter operations of the B-G Project. The Power Authority is seeking authorization to continue operating the B-G Project in its current configuration and as it is currently licensed to operate.

1.8 Impacts of Plan Not to Modify the Project (18 CFR Section 16(a)(8))

The B-G Project will continue to provide low-cost energy and store water for power production during periods of peak energy demand. When needed, the B-G Project will continue to provide “black start” capability to restart other Power Authority facilities and, eventually, the statewide energy grid. The B-G Project will continue to provide the ancillary services of regulation reserve and voltage support to the statewide power system. The Project will be operated under the terms and conditions of a new license issued by the Commission, which will be based on a license that conforms with the comprehensive development of Schoharie Creek.

1.9 The Power Authority’s Ability to Operate and Maintain the Project in New License Term (18 CFR Section 16(a)(9))

The Power Authority’s successful operation of the Project since 1973 demonstrates its financial ability and personnel experience to operate the Project during the new license term.

1.9.1 Financial Resources

The Power Authority is the nation’s largest state-owned public power agency. In 2015 the Power Authority had revenue of \$2.65 billion and an Aa1/AA/AA bond rating. The Power Authority has the financial resources to operate the Project during the term of the new license.

1.9.2 Personnel Resources

The Power Authority employs approximately 150 people at the B-G Project and at the adjacent Visitors Center. The Project has a full complement of operations personnel who perform all necessary day-to-day functions related to Project operations and maintenance. In addition to round-the-clock operations personnel, the Project staff includes full-time security, safety, environmental, real estate, and community affairs staff.

On-site staff is fully qualified to handle all aspects of the operation and maintenance of the Project. The Project is fully equipped to allow staff to perform virtually all routine maintenance functions. The Project has a full complement of heavy equipment, which the staff is fully trained and certified to operate. All personnel receive training commensurate with their responsibilities in an ongoing effort to improve their ability to operate the Project in the safest and most efficient manner possible.

In addition to on-site Project personnel, the Power Authority’s corporate support staff provides additional expertise relative to all aspects of Project operations. Corporate staff includes personnel from the Engineering, Safety, Environmental, Real Estate, Legal, and Public & Governmental Affairs groups. Corporate staff works closely with Project staff on numerous Project assignments. Examples of programs with substantial involvement of corporate staff include the Life Extension and Modernization Program, safety training, planned refurbishment of the Visitors Center, coordination of license compliance with staff of the Commission’s Regional Office, and review of legal matters.

The Power Authority's success in the operation of the B-G Project demonstrates its ability to operate the Project during the term of the new license.

1.10 The Power Authority's Notification of Adjacent Landowners Regarding Expansion of Project on Additional Lands (18 CFR Section 16(a)(10))

The Power Authority is not proposing any expansion of the Project onto additional lands.

1.11 Power Authority's Electricity Efficiency Consumption Improvement Programs (18 CFR Section 16(a)(11))

There are no regulatory requirements for the Power Authority's participation in energy conservation programs. Nonetheless, the Power Authority voluntarily participates in and sponsors a number of energy conservation programs.

Through October 2016, the Power Authority has authorized over \$2.4 billion in funding for those programs. Through these initiatives, the Power Authority has produced over \$211 million in annual savings for participants in these programs. Since 1990, the Power Authority's national award-winning energy efficiency programs are the centerpiece of its conservation efforts. Recognized by the U.S. Department of Energy, the American Public Power Association and the National Environmental Awards Council, the programs provide energy-efficiency improvements, with no up-front costs, to public schools and other government facilities. As part of its efforts to save energy and reduce taxpayers' costs, the Power Authority has undertaken energy-efficiency projects at more than 4,000 public facilities across the state and lowered the utility bills of state and municipal governments by approximately \$199 million annually. These measures have reduced peak electricity demand by approximately 242,000 kilowatts—equivalent to the output of a medium-sized power plant. The measures have also reduced heat-trapping greenhouse gas emissions by nearly 1,067,717 tons a year and annual oil use by over three million barrels.

1.12 Names and Mailing Addresses of Indian Tribes Affected by Applicant's Proposed Project (18 CFR Section 16(a)(12))

There are no Indian Tribes with lands occupied by the B-G Project or which would otherwise be affected by the relicensing. Nevertheless, the Power Authority has included the following Indian Tribes and Nations in the distribution of this license application. .

Delaware Nation
Kerry Holton, President
P.O. Box 825
Anadarko, OK 73005

Delaware Tribe of Indians
Paula Pechonick, Chief
170 N.E. Barbara
Bartlesville, OK 74006

Saint Regis Mohawk Tribe
Chief Ron LaFrance Jr.
412 State Route 37
Akwesasne, New York 13655

Saint Regis Mohawk Tribe
Chief Paul O. Thompson
412 State Route 37
Akwasasne, New York 13655

Saint Regis Mohawk Tribe
Chief Beverly Cook
412 State Route 37

Akwasasne, New York 13655

Robert Chicks, Tribal President
Stockbridge-Munsee Band of the
Mohican Nation, Wisconsin
Route 1, P.O. Box 70
Bowler, WI 54416

In accordance with correspondence received from the Bureau of Indian Affairs (BIA) dated November 20, 2012, Indian Tribes and Nations that may have an interest in the relicensing of the Project include the Delaware Nation, the Delaware Tribe of Indians, the St. Regis Mohawk Tribe, and the Stockbridge-Munsee Community Band of Mohican Indians. In November 2013, NYPA sent letters to the aforementioned Tribes and Nations, requesting any existing, relevant, and reasonably available information with respect to resources of concern. The Tribal Historic Preservation Office (THPO) for the Stockbridge-Munsee Community Band of Mohican Indians indicated that the Project is in Mohican territory but it was not aware of any cultural sites within the Project area. The St. Regis Mohawk Tribe stated that the Project does occur in an area designated as culturally sensitive to the Nation but did not identify any specific properties.

2 Information to be Provided by Applicant Who is an Existing Licensee Applicants (18 CFR Section 16.10 (b))

2.1 Statement of Measures by the Power Authority to Ensure Safe Management, Operation, and Maintenance of the Project (18 CFR Section 16(b)(2))

As described in Section 2.2 of this Exhibit, the B-G Project is a closed-cycle system; it is not a flood-control facility nor a water-supply facility. Outflows are maintained as close as practicable to inflows, and the current FERC license requires the Power Authority to operate the reservoirs in such a manner that releases from the Lower Reservoir during flood flows are no greater than flows that would occur in the absence of the B-G Project. The Lower Dam is equipped with spillway Tainter gates and low-level valves that permit the appropriate release of water downstream.

There are twenty (20) outdoor warning sirens along the Schoharie Creek to be used in High Water Emergencies. The sirens are installed on 50 foot wood utility poles with rotating sirens on top that are remotely activated during major flood events. The Power Authority cooperates with Schoharie County to support maintenance of these downstream warning sirens. In addition, the Power Authority is in compliance with all Emergency Action Plan requirements. The B-G Project and areas immediately downstream are equipped with remote video cameras that are monitored from the B-G Project control room, which is staffed with full time operators 24 hours per day year-round.

The Power Authority is not proposing any changes that may affect the Emergency Action Plan.

Instrumentation in place to monitor performance of the project embankments consists of hydraulic piezometers, ground water monitoring wells, seepage collection systems, weirs, crest settlement monuments and hydraulic settlement gauges. In addition, there are hydraulic piezometers to monitor uplift pressures in the powerhouse foundation and measurement pins located in specific areas. The instrumentation is evaluated through ongoing FERC-mandated Part 12 inspections, and updated or replaced in accordance with those inspections as needed.

2.2 Employee and Public Safety (18 CFR Section 16(b)(2)(v))

2.2.1 Employee Safety

The Power Authority operates the B-G Project consistent with its corporate commitment to employee safety. This commitment begins with compliance with applicable local, state, and federal regulations regarding the safe operation of industrial and electrical facilities. The commitment is implemented through a rigorous safety program at the Project. Rigorous inspection and maintenance programs ensure employee safety relative to operating equipment and facilities. The Corporate Safety Oversight Group takes an active role in shaping the Power Authority's Industrial Safety Program and works closely with the Safety Administrators regarding Project issues, goals, and strategies that impact the safety program.

The Power Authority's Safety Program involves employee training sessions as well as making safety information available to employees. The Power Authority uses a Safety Newsletter to inform employees about pertinent regulatory activities, safety alerts, and corporate safety initiatives. Information in the newsletter is often discussed in periodic "Toolbox Talks." In addition to these meetings, more extensive onsite and offsite training sessions are led by staff of the Corporate Safety Group and Project Safety

Administrators. Information on safety issues and policies is made available on the Authority's Intranet WebPage. The Authority has a union/management safety committee that meets monthly. The safety record for the project employees over the last ten years is provided below.

Table 2.2.1-1: Number of OSHA Recordable Employee Injuries by Year

Year	No. of Employee Injuries
2006	3
2007	1
2008	5
2009	4
2010	2
2011	6
2012	3
2013	2
2014	3
2015	6

2.2.2 Public Safety

The Power Authority places a high priority on public safety at the B-G Project. Public safety at the B-G Project begins with limiting public access to areas where access is safe. Types of access are regulated to ensure safe and compatible use of Project property. As required by the Commission, the Power Authority's most recent Public Safety Plan includes measures (lighting, signage, audible warnings, fencing, and the like). In accordance with the Commission's regulations at 18 CFR 12.10, the Power Authority files public incident safety reports with the Commission's New York Regional Office (NYRO). During the past ten years, there have been no public safety incidents that required the filing of a public safety incident report.

2.3 Current Operation of Project Including Constraints Affecting Operations (18 CFR Section 16(b)(3))

As discussed in Exhibit B, the B-G Project is a closed-cycle system, recycling water between the two reservoirs during operation. No additional water is required on a continual basis, except for small amounts needed to replenish water depleted from the system by means of evaporation, minor seepage losses, or operating releases.

As discussed in Exhibit B, inflow to the Project includes spill from the New York City Department of Environmental Protection's (NYCDEP's) Schoharie Reservoir (Gilboa Dam), approximately 5 miles upstream of the Lower Reservoir, as well as runoff from about 40 square miles of the Schoharie Creek watershed between Gilboa Dam and the B-G Project. Under normal conditions, however, there is little or no spill from Schoharie Reservoir. The B-G Project's 1974 "Operating Plan for Water Management" specifies that Project outflow should be maintained as close as practicable to inflow, or what flows would be without the Project present. Gages upstream and downstream of the Project and reservoir volume calculations are used to equate outflow from the Project with inflow to it.

Low-level valves and spillway Tainter gates at the Lower Dam enable the B-G Project to release water from the Lower Reservoir into Schoharie Creek for the entire range of inflows to the Project. For flows less than 25 cfs, four low-level discharge valves are used to release flows downstream. During periods of moderate flow, when releases of greater than 25 cfs are needed, two Howell-Bunger valves are used to release flows up to 700 cfs. For flows greater than 700 cfs, the three spillway Tainter gates are used to maintain the Lower Reservoir's operating full-pool elevation of 900 feet.

2.4 History of Project Operations and Record of Programs to Upgrade Operation and Maintenance of the Project (18 CFR Section 16(b)(4))

Maintenance operations at the Project are carried out by the Power Authority's staff located at the Project. Project staff is supported by engineering, Project management, safety, environmental, real estate, and other staff from the Power Authority's corporate offices.

Operations at the Project include routine maintenance of electrical and mechanical equipment and associated facilities. Equipment maintenance includes scheduled maintenance activities such as examination of and repair to turbine/generator units to ensure their continued availability and optimum performance. Cavitation damage to the turbine wheels, a normal operational phenomenon, is repaired during scheduled outages usually lasting a few weeks. Similarly, replacement of components in the commutators, and replacement of pumps, heat exchangers, filters, transducers and other equipment that degrades during the normal course of power plant operations is routinely carried out by plant staff as part of a preventive maintenance program. Such scheduled, ongoing maintenance activities are planned to minimize effects on energy production. Longer-duration, planned outages that require disassembly of the units for overhaul are typically scheduled for periods when impacts to energy generation can be minimized.

All civil structures are inspected annually by the Power Authority. Power Authority staff routinely perform maintenance activities such as removal of woody vegetation on earthen dikes or repairs to structural concrete.

A \$135-million four-year program to modernize and extend the life of the B-G Project was completed in May 2010. As part of a four-year program known as LEM (Life Extension and Modernization), one of the Project's four turbine-generator units was taken out of service each fall for approximately eight months. Most of the units' mechanical and electrical components were replaced, with repairs made to virtually all other parts. Other work involved with the LEM program included replacement of main power transformers, circuit breakers, exciters, and related equipment.

2.5 Summary of Lost Generation for Unplanned Outages at Project over Last Five Years (18 CFR Section 16(b)(5))

[Table 2.5-1](#) provides a summary of unplanned unit outages at the Project from 2011 through 2015. Where outage times are less than 24 hours, repairs were generally made by Project staff with equipment or materials located at the Project. For outages that exceeded 24 hours, off-site procurement of equipment or materials for the repair work was generally required, causing a longer outage time.

Over the five-year period, the average annual amount of unscheduled outage downtime was 1000 unit hours. Typically, when a unit is forced out of service enough generating capacity remains to meet scheduled load.

2.6 License Compliance Activities (18 CFR Section 16(b)(6))

The current license for the Project contains license articles that address Project construction, Project operation such as minimum flow releases, recreation and land management, fish and wildlife issues, and annual charges. Numerous annual tests and filings are required under the terms and conditions of the current Project license and applicable 18 CFR regulations. The Power Authority is responsible for a number of compliance activities, including operational monitoring, Commission-mandated operation and maintenance remedial actions, EAP training and testing, annual spillway and gate testing, dam safety issues, coordinating compliance studies or inspections, and land conveyance reporting.

The Power Authority has had no instances of non-compliance with the terms and conditions of the current license. All dam safety-related recommendations have been addressed in a timely manner to ensure continued safe operation of the Project facilities. Successful compliance is accomplished by use of a computerized compliance tracking system. When communications are received from the Commission, the documentation is distributed to appropriate Power Authority departments. Concurrently, the request is logged into a Compliance Tracking Database for follow-up. The person responsible for the action is identified in the tracking system. The tracking system is continually updated to reflect appropriate refinements.

In the course of its compliance obligations, the Power Authority has established a strong working relationship with the Commission. The Power Authority has responded in a timely manner to numerous requests by Commission staff for data or assistance. The Power Authority's Project and corporate staff jointly attend annual operations inspections to review salient issues with Commission staff.

2.7 Actions Related to the Project that Affect the Public (18 CFR Section 16(b)(7))

The Project makes numerous contributions to local communities, beginning with the Project's low-cost power. The B-G Project also affects the state, the B-G Region, and the local and neighboring communities through its expenditures, which include salaries to employees, and operation and maintenance costs (e.g., hiring, contractors, and purchasing materials). The B-G Project contributed about \$17.7 million in total direct expenditures to the local economies in 2014. Expenditures at the B-G Project also include payments that the Power Authority makes to support First Responder Organizations in providing first responder services to the B-G Project. During the period 2009 – 2011 and 2013, total payments ranged from a low of \$10,000 in 2011 to a high of \$18,000 in 2010. Payments in 2012 were \$182,526 and reflect the assistance the Power Authority provided to the local and neighboring communities to support recovery efforts from the effects of Tropical Storm Irene.

During the new license term, the Power Authority will continue its role as an active participant in the life of its community. The Power Authority has developed or restored several public educational and recreational sites near the Project that will remain open for public use. The Lansing Manor Complex is a historic 19th century farmstead, which was restored by the Power Authority. The house of the Lansing Manor Complex operates as a house museum in cooperation with the Schoharie County Historical Society. The Lansing Manor Complex's former barn contains the Power Authority's Visitors Center, which is open to the public year-round and offers exhibits, interactive displays, and a number of educational and public programs. The lands surrounding the Manor and Visitors Center also provide numerous recreational opportunities. The Power Authority also developed the nearby Mine Kill State Park in conjunction with the construction of the

Project. Mine Kill State Park is operated by NYSOPRHP. In August 2015, the Power Authority and NYSORHP agreed to eliminate parking and swimming fees at Mine Kill State Park, which is adjacent to the B-G Project's Visitors Center, saving park visitors over \$20,000 annually. The Power Authority compensates NYSORRHP for the operation and maintenance of Mine Kill State Park, paying over \$4.6 million in operations and \$2.1 million for capital projects since 2005.

2.8 Ownership and Operating Expenses that would be Reduced if the License was Transferred to Another Licensee (18 CFR Section 16(b)(8))

If the Power Authority does not receive a new license for the B-G Project, their annual costs would be reduced by the amount of Project capital and operation and maintenance costs described in Exhibit D. The Power Authority would also not incur the costs associated with the protection, mitigation and enhancement measures proposed as part of a new license (Exhibit D).

2.9 Annual Fees Paid under Part I of the Federal Power Act for Use of Any Federal or Indian Lands Included in the Project Boundary (18 CFR Section 16(b)(9))

The B-G Project does not occupy Federal or Indian Lands.

Table 2.5-1: Summary of Unplanned Outages, 2011-2015

Date(s)	Unit No.	Duration of Outage (hrs.)	Cause	Corrective Action Taken
1/3/2011	4	0.2	Governor problem.	Repaired
2/7/2011	1	6.3	Oil leak on spherical valve.	Repaired
3/14/2011	2	0.6	Stub bus switching for adjacent unit.	Repaired
5/7/2011	2	0.2	Governor Versamax failure.	Repaired
7/20/2011	1	0.7	86BS lockout due to bad thrust bearing relay.	Repaired
7/20/2011	2	0.8	86BS lockout due to packing box high temp.	Repaired
8/28/2011	1	6.8	Due to high water/flooding (Tropical Storm Irene)	None - resumed operations after outage
8/28/2011	2	6.8	Due to high water/flooding (Tropical Storm Irene)	None - resumed operations after outage
8/28/2011	3	6.8	Due to high water/flooding (Tropical Storm Irene)	None - resumed operations after outage
8/28/2011	4	6.8	Due to high water/flooding (Tropical Storm Irene)	None - resumed operations after outage
9/5/2011	3	0.3	Due to governor trip; cause unknown	None - resumed operations after outage
11/14/2011	4	0.7	Due to switching Transformer #3	None - resumed operations after outage
12/12/2011	1	8.4	Downstream seal failed to release due to faulty 550 changeover valve	Repaired
Total Hours of Forced Outages for 2011		45.4		
1/5/2012	3	0.58	Governor switch replacement	Repaired
1/11/2012	2	0.63	Permissive switch improperly aligned	Repaired
1/18/2012	1	0.10	Cooling water pumps tripped	None - resumed operations after outage
3/25/2012	1	0.30	Governor trouble - Versamax issue	None - resumed operations after outage
3/25/2012	2	0.20	Governor trouble - Versamax issue	None - resumed operations after outage
5/11/2012	3	0.18	Versamax hardware failure	Repaired
5/29/2012	4	0.28	Tripped; Thrust and lower guide bearing oil reserve high level	Repaired
6/21/2012	4	2.92	Thrust bearing oil cooler repairs	Repaired
6/27-6/28/2012	4	31.18	Outage extension due to oil cooler oil leak	Repaired
10/27-10/29-2012	1	53.40	Unavailable due to Hurricane Sandy	None - resumed operations after outage
10/27-10/29-2012	3	53.30	Unavailable due to Hurricane Sandy	None - resumed operations after outage
10/27-10/29-2012	4	53.40	Unavailable due to Hurricane Sandy	None - resumed operations after outage
Total Hours of Forced Outages for 2012		196.5		
1/12-1/15/2013	2	182.6	Main transformer failure	Repaired

Date(s)	Unit No.	Duration of Outage (hrs.)	Cause	Corrective Action Taken
1/12/2013	1	0.3	Switching for BG Unit 2	None - resumed operations after outage
1/12-1/15/2013	2	60.2	Transformer Kelman gas analyzer alarm	Repaired
1/14/2013	1	0.4	Re-energizing BG Unit 2 transformer	None - resumed operations after outage
1/14/2013	3	0.3	Fault on governor programmable logic controller	Repaired
5/1/2013	2	1	Switching for BG Unit 1	None - resumed operations after outage
5/1/2013	4	2.4	Protective relay operations caused by GSU #3 work	Repaired
5/2-5/4/2013	1	63.2	Synchronizing PT 116 'A' phase failure	Repaired
5/2/2013	2	0.9	Protective relay operations caused by BG Unit 1 testing	None - resumed operations after outage
5/3/2013	2	1.2	Switching for BG Unit 1	None - resumed operations after outage
5/4/2013	2	0.2	Switching for BG Unit 1	None - resumed operations after outage
5/17/2013	3	0.6	Main transformer tap changer replacement	Repaired
7/23/2013	4	0.3	Governor trip - Atlas Fault	None - resumed operations after outage
8/4/2013	1	0.3	Governor trip - Atlas Fault	None - resumed operations after outage
8/4/2013	2	0.3	Governor trip - Atlas Fault	None - resumed operations after outage
9/20/2013	3	0.3	Governor trip - Atlas Fault	None - resumed operations after outage
Total Hours of Forced Outages for 2013		314.5		
4/9/2014	1	0.2	Governor trouble; Versamax issue	None - resumed operations after outage
4/9/2014	2	0.4	Governor trouble; Versamax issue	None - resumed operations after outage
5/26/2014	3	0.2	Versamax failure	None - resumed operations after outage
6/25/2014	3	0.6	Switching for Unit 4	None - resumed operations after outage
7/15/2014	3	174.4	Water in bearing oil reservoir	Repaired
7/23/2014	2	0.9	Faulty bearing temperature shutdown relay	Repaired
9/15/2014	2	4.3	Spherical valve servo adjustment	Repaired
12/5-12/31/2014	3	632.5	Cracked rotor ledges repair	Repaired
12/14/2014	1	0.2	Governor Versamax failure	None - resumed operations after outage
12/14/2014	2	0.2	Governor Versamax failure	None - resumed operations after outage
12/17/2014	1	1.0	Due to Unit 2 switching	None - resumed operations after outage
12/17/2014	1	0.3	Due to Unit 2 switching	None - resumed operations after outage
12/22/2014	4	0.4	Station service switching	None - resumed operations after outage

Date(s)	Unit No.	Duration of Outage (hrs.)	Cause	Corrective Action Taken
Total Hours of Forced Outages for 2014		815.6		
1/1-1/31/2015	3	744.0	Repair rotor crack	Repaired
1/9/2015	4	0.4	Versamax failure	None - resumed operations after outage
1/15/2015	4	4.7	Downstream seal failed to operate	Repaired
1/15/2015	4	2.5	Downstream seal failed to operate	Repaired
2/1-2/28/2015	3	672.0	Repair rotor crack	Repaired
2/8/2015	1	2.1	Faulty temperature relay	Repaired
3/1-3/31/2015	3	743.0	Repair rotor crack	Repaired
3/16-3/17/2015	2	3.8	Governor wiring issue	Repaired
3/21-3/31/2015	1	253.5	Water in oil	Repaired
4/1-4/30/2015	3	720.0	Repair rotor crack	Repaired
4/1-4/7/2015	1	161.5	Failed thrust and lower guide bearing heat exchanger	Repaired
5/1-5/11/2015	3	250.7	Repair rotor crack	Repaired
5/11/2015	3	0.1	Unit balance checks	None - resumed operations after outage
5/11/2015	3	2.3	Repair rotor crack	Repaired
5/11/2015	3	1.1	Unit balance checks	None - resumed operations after outage
5/11-5/12/2015	3	29.9	Repair rotor crack	Repaired
5/11/2015	4	0.5	Due to Unit 3 switching	None - resumed operations after outage
5/12/2015	3	1.1	Unit balance checks	None - resumed operations after outage
5/12/2015	3	0.9	Repair rotor crack	None - resumed operations after outage
5/12/2015	4	0.3	Due to Unit 3 switching	None - resumed operations after outage
8/20/2015	1	0.2	Governor trouble - Versamax issue	None - resumed operations after outage
8/20/2015	3	4.9	High pressure oil pump (HPOP) replacement	Repaired
9/27/2015	1	7.6	3.0 earthquake inspection	None - resumed operations after outage
9/27/2015	3	7.6	3.0 earthquake inspection	None - resumed operations after outage
9/27/2015	4	7.6	3.0 earthquake inspection	None - resumed operations after outage
10/6/2015	3	0.3	Versamax failure	None - resumed operations after outage
10/24/2015	4	6.6	Spherical valve failure	Repaired
12/16/2015	1	0.4	Due to Unit 2 switching	None - resumed operations after outage
12/17/2015	1	0.2	Due to Unit 2 switching	None - resumed operations after outage
Total Hours of Forced Outages for 2015		3629.8		

Date(s)	Unit No.	Duration of Outage (hrs.)	Cause	Corrective Action Taken
Total Hours for All Years		5001.8		
Average No. of Hours Annually		1000.4		

3 Literature Cited

New York Power Authority. (2016). Socioeconomic Study Report. Blenheim-Gilboa Pumped Storage Project (FERC No. 2685).