



**NY Power  
Authority**

**Canal  
Corporation**

**MINUTES OF THE SPECIAL JOINT MEETING  
OF THE FINANCE COMMITTEE  
July 16, 2019**

**Table of Contents**

<b><u>Subject</u></b>	<b><u>Page No.</u></b>	<b><u>Exhibit</u></b>
<b>Introduction</b>	<b>2</b>	
<b>1. Adoption of the July 16, 2019 Proposed Special Meeting Agenda</b>	<b>3</b>	
<b>2. DISCUSSION AGENDA:</b>	<b>4</b>	
<b>a. Niagara Power Project – Robert Moses Power Project – Life Extension and Modernization and Controls Upgrade Program – Program Approval, Capital Expenditure Authorization Request and Contract Awards for Integrated Controls and Penstock Platform</b>	<b>4</b>	<b>2a-A</b>
<b>b. R.M. Flynn Power Plant – Long-Term Service and Extended Parts Agreement</b>	<b>12</b>	
<b>3. Next Meeting</b>	<b>14</b>	
<b>Closing</b>	<b>15</b>	

Minutes of the special joint meeting of the New York Power Authority and Canal Corporation's Finance Committee held at the Clarence D. Rappleyea Building at 123 Main Street, White Plains, New York at approximately 11:00 a.m.

**Members of the Finance Committee present were:**

Tracy B. McKibben - Chair  
John R. Koelmel  
Dennis Trainor

Anne M. Kress - Excused  
Michael Balboni - Excused

---

**Also in attendance were:**

Gil Quiniones	President and Chief Executive Officer
Justin Driscoll	Executive Vice President and General Counsel
Joseph Kessler	Executive Vice President and Chief Operations Officer
Sarah Salati	Executive Vice President and Chief Commercial Officer
Lee Garza	Senior Vice President - Financial Operations and Acting Controller
Soubhagya Parija	Senior Vice President & Chief Risk Officer
Karen Delince	Vice President and Corporate Secretary
Daniella Piper	Vice President – Digital Transformation / Chief of Staff
John Canale	Vice President – Strategic Supply Management
Patricia Lombardi	Vice President – Project Manager
Thakur Sundeep	Controller
Tim Zandes	Regional Manager – SENY
Danny Padron	Director of Operations – SENY
Dave Work	Director – Power Contracts & Tariffs
Mary Cahill	Manager – Executive Office
Lorna Johnson	Senior Associate Corporate Secretary
Sheila Quatrocci	Associate Corporate Secretary
Randy Kreuz	President – Customer Care Network

---

Chairperson Tracy McKibben presided over the meeting. Corporate Secretary Delince kept the Minutes.

**Introduction**

***Chairperson Tracy McKibben welcomed committee members and the Authority's senior staff to the meeting. She said that the meeting had been duly noticed as required by the Open Meetings Law and called the meeting to order pursuant to Section B(4) of the Finance Committee Charter.***

1. **Adoption of the July 16, 2019 Proposed Special Meeting Agenda**

Upon motion made by member Dennis Trainor and seconded by member John Koelmel the agenda for the meeting was adopted.

2. **DISCUSSION AGENDA:**

a. **Niagara Power Project – Robert Moses Power Project – Life Extension and Modernization and Controls Upgrade – Program Approval, Capital Expenditure Authorization Request and Contract Awards for Integrated Controls and Penstock Platform**

---

The President and Chief Executive Officer submitted the following report:

“SUMMARY

The Finance Committee is requested to recommend to the Trustees at their July meeting the approval of a Life Extension and Modernization Program ('LEM Program') for the estimated cost of \$1.1 billion to modernize the Robert Moses Power Plant ("RMPP"). The modernization will replace aging equipment, enhance plant performance in the New York Independent System Operator market, and maintain a reliable and competitive power production facility.

The Finance Committee is further requested to recommend to the Trustees to authorize capital expenditures in the amount of \$213 million to initiate engineering, procurement, construction and delivery of long-lead-time components.

The Finance Committee is further requested to recommend to the Trustees to approve the award of a 14-year design-build contract to Burns & McDonnell Consultants P.C ('BMC'), Kansas City, Missouri, in the amount of \$134 million (including \$21M in design options and \$36M in escalation) to replace the unit and plant control systems for all 13 hydro-generating units, to update the main control room and add a back-up control room. At this time, BMC will only be authorized to proceed up to the first three units as well as all main and backup control room work.

The Finance Committee is further requested to recommend to the Trustees to approve the award of a 14-year contract to The State Group ('TSG'), Buffalo, NY for \$69 million for the Penstock Platform Project. At this time, TSG will only be authorized to proceed with fabrication of the platform and mobilization for up to the first three units.

In accordance with the Authority's Expenditure Authorization Procedures, capital expenditures in excess of \$6 million require the Trustees' approval.

BACKGROUND

The RMPP has had only minor control system upgrades since its initial construction in the 1960's. The upgrade project implemented in the 1990's did not replace the relay-based controls systems and mechanical governors, which were still state-of-the-art equipment at the time, and mechanical fatigue of the turbine-generator and other systems was not considered likely at that age, therefore, no changes were made. This LEM Program will overhaul the 13 generating units and their associated auxiliary power equipment to bring the plant into the modern digital operating era, adding the ability for backup controls for the plant and switchyards and replacing equipment nearing the end of its life.

Authority staff conducted an analysis of RMPP assets, including performance testing using sensors, and have put together this Program which includes, but is not limited to, replacing the head covers, shafts, wickets gates, governors, refurbishing the stators, guide bearings, iso-phase bus, and other ancillary systems to ensure reliable plant operation and asset management, provides for another 60 years of services and which is less costly than reacting to a major failure due to fatigue.

The LEM Program is comprised of four main projects: Controls Upgrade, Mechanical/Electrical Overhauls ('M/E LEM'), Penstock Platform, and the 630-ton Gantry Crane Upgrade. Each of these projects will have its own Capital Expenditure Authorization Request ('CEAR'). The RMPP LEM Program estimated at \$1.1 billion is the sum of each of these individual CEARs.

The Controls Upgrade will start prior to the M/E LEM, with design of the system scheduled for 2019-2020 and the backup and main control room work and first unit control upgrade commencing by 3Q 2020. This first unit control upgrade is expected to require nine months to complete followed by a full year of monitoring to ensure the most efficient operation and resolve anticipated operational adjustments; subsequent unit control upgrades will require seven months to complete.

The Program schedule targets award of the turbine and motor generator overhaul contracts by 2021 to support the first M/E LEM unit starting in 2023 at which time the LPGP LEM Program is expected to be complete. Long lead items such as the wicket gates and shafts will be ordered in early 2020 via direct material contracts and the head covers will be released for fabrication under the turbine generator contract in late 2021. The overall Program is estimated for completion by 2034.

The current funding request will be for the work associated with the Controls Upgrade of the first three units, backup and main control room upgrades, the Penstock Platform fabrication and installation for the first three units, the 630-Ton Crane Upgrades and release of the first long lead items such as wicket gates and turbine shafts. Funding for the next three units, as well as future contract awards and anticipated escalation costs for material and labor, will be requested in future stages of the Program.

## DISCUSSION

### Overall Program Authorization

The Niagara Power Project generally ranks second in annual energy production among hydroelectric plants in the U.S. averaging 14,000 GWHRs/year and, considering its location and the services it provides to New York and the NYISO market, is a vital asset for the State. RMNPP has an unusually high capacity factor; therefore, that forced outages are more likely to result in inability to meet market and customer commitments. A significant failure at RMNPP could have severe consequences to the Authority's customers, the market and the Authority itself.

The total Program Cost is estimated at \$1,100,000,000 as follows:

Preliminary Engineering/Engineering Design	\$ 38,000,000
Material Procurement & Construction/Installation	\$ 498,000,000
Authority Direct and Indirect Expenses	\$ 98,000,000
Contingency and Escalation	\$ 466,000,000
<b>TOTAL</b>	<b>\$1,100,000,000</b>

The Finance Committee is requested to recommend that the Board approve expenditures for engineering, procurement, construction and Authority direct and indirect costs to continue the orderly planning, design, long lead material procurement and implementation of the work as follows:

	Total Estimated (\$000)	Previously Authorized (\$000)	Current Request (\$000)	Balance to be Authorized (\$000)
Preliminary Engineering/Licensing	\$ 7,476	\$ 7,476	\$ 0	\$ 0
Engineering and Design	\$ 25,000	\$ 0	\$ 11,200	\$ 13,800
Procurement/Constructions	\$ 943,650	\$ 0	\$179,800	\$ 763,850
Authority Direct/Indirect	\$ 123,874	\$ 3,522	\$ 22,000	\$ 98,352
Total Authorization Requested	\$1,100,000	\$10,998	\$213,000	\$876,002

The current funding request includes approximately 30% of the anticipated engineering costs, including evaluation of the unit Iso-phase and intermediate bus, and initial procurement of wicket gates, spare generator and turbine shafts. The request also includes funding for the work on the first three unit controls as well as the work required for the main and backup control rooms.

### **Integrated Controls**

A Request for Qualifications ('RFQ'), No. Q18-6452JT, was issued on May 22, 2018 through the Authority's Ariba system and was advertised in the New York State *Contract Reporter* to solicit information from interested vendors, enabling the Authority to evaluate the capabilities and capacity of each vendor with respect to the Control System and establish a list of most qualified suppliers to which a Request for Proposal ('RFP') for the specific Scopes of Work ('SOW') for the RMNPP Controls LEM initiative was issued.

On June 21, 2018, nine suppliers submitted their qualifications in response to the RFQ. The submitted information was reviewed and evaluated by a multi-disciplined team comprised of Engineering, Strategic Supply Management, Plant Operations and Maintenance, Project Management, and Environmental Health & Safety. As part of the evaluation, phone interviews were held with each of the responding suppliers to review their submissions. The most qualified four respondents were selected for the RFP stage.

An RFP was issued on November 20, 2018 describing the scope of design, testing, fabrication, installation and renovation associated with the controls systems to the firms selected in the RFQ process. Proposals were received as listed below on April 15, 2019:

<b><u>Description</u></b>	<b>Location</b>	<b>Total Bid Amount</b> (without Escalation)
<b>ABB Inc.</b>	Burlington, Ontario Canada	\$ 120,400,000.00
<b>Burns &amp; McDonnell Consultants, P.C.</b>	Kansas City, Missouri	\$ 89,380,170.90
<b>Voith Hydro</b>	York, Pennsylvania	\$ 86,233,611.00

All proposals were reviewed thoroughly by the same Evaluation Committee and were determined to be technically compliant. The proposals were reviewed and evaluated based on the evaluative criteria established in the RFP; best value, integrated control system and control room designs, proposal completeness, ability to meet the project schedule, experience in performing similar work, experience working with the Authority, and safety record.

Burns & McDonnell Consultants, P.C ('BMC') was determined to be the best value based on its extensive knowledge of projects of this scope, size, and complexity. In addition, BMC's proposed approach to the project is the most practical using industry leading control systems that aligns with the Authority's goals for a single integrated digital control system. Accordingly, the Evaluation Committee recommends an award to BMC for \$134,000,000 including design options and escalation.

#### Penstock Platform

An RFP was issued on September 7, 2018 and on November 29, 2018, two proposals were received. In an effort to expand the pool of potential bidders, the bid scope was revised, and the RFP was re-bid on February 21, 2019. On April 5, 2019, three proposals were received as listed below:

<b><u>Description</u></b>	<b>Location</b>	<b>Total Bid Amount</b>
<b>International Chimney</b>	Buffalo, NY	\$114,220,295
<b>The State Group</b>	Buffalo, NY	\$57,819,769
<b>Hohl Industrial</b>	Tonawanda, NY	\$41,576,285

The proposals were reviewed thoroughly and evaluated by a multi-disciplined team, comprised of Engineering, Strategic Supply Management, Plant Operations and Maintenance, Project Management, and Environmental Health & Safety. The proposals were reviewed and evaluated based on the evaluation criteria established in the RFP, best value, proposal completeness, ability to meet the project schedule, experience in performing similar work, and safety record.

The State Group ('TSG') was determined to be the best value based on their extensive knowledge of the scope-of-work and capability of completing this project in accordance with the required schedule. TSG is an ISO 9001 certified company with a local Buffalo office that will allow for more efficient travel to and from the power plant for project quality assurance, quality control, and oversight. Fabrication will be taking place within driving distance from the power plant. TSG will meet the MWBE goal requirements. Accordingly, the Evaluation Committee recommends an award to TSG for \$69,000,000 for selected options and escalation.

#### FISCAL INFORMATION

Payment associated with this project will be made from the Authority's Capital Fund. Funding in the amount of \$11 million has been authorized, to date, to proceed with preliminary engineering, specification development and bidding for the controls upgrade work.



## RECOMMENDATION

It is requested that the Finance Committee recommend that the Trustees approve a Life Extension and Modernization Program at the Niagara Robert Moses Power Project for the estimated cost of \$1.1 billion.

It is further requested that the Finance Committee recommend that the Trustees authorize capital expenditures in the amount of \$213 million to initiate engineering, procurement, construction and delivery of long-lead-time components.

It is further requested that the Finance Committee recommend that the Trustees approve the award of a 14-year contract to Burns & McDonnell Consultants P.C., Kansas City, Missouri, in the amount of \$134 million to replace the unit and plant control systems for all 13 hydro-generating units, to update the main control room and add a back-up control room.

It is further requested that the Finance Committee recommend that the Trustees approve the award of a 14-year contract to The State Group, Buffalo, NY for \$58 million for the Penstock Platform Project.”

*Ms. Patricia Lombardi, Vice President of Project Management and Mr. Randy Kreuz, President of Customer Care Network provided highlights of staff's recommendation for the Niagara Power Project, Robert Moses Life Extension and modernization and controls upgrade program to the Committee (Exhibit 2a-A).*

*Ms. Lombardi provided a brief overview of the major investments made at the Authority's operating facilities over the last 30 years.*

*The Robert Moses Power Plant upgrade program started in the early 1990s through the mid-2000s, the main objective of which was to increase the capacity of the Plant by approximately 200 megawatts and improve the efficiency of the units through a modern hydraulic design. The program included the replacement of the turbine runners with stainless steel alloys and replacement of the generator step-up transformers. Due to condition and age, the majority of the equipment were not replaced at that time. The upgrade was successful, performance improved, and the objective met. The upgrade allowed for additional marketing capacity in the firm and peaking capacity markets.*

*The Authority then embarked on the Robert Moses Standardization Program, which was conducted on the first three units. Among other projects, the Authority installed new digital exciters, which were later added to the other units so that all 13 units conformed to the program. This further allowed the Authority to keep up with the modern technology and an opportunity to examine the first units overhauled and gauge the rate of deterioration. Over the years, other investments have been made at the Robert Moses Power Plant, including rewinds and restacks.*

*The first major Life Extension & Modernization Program (“LEM”) was embarked at the St. Lawrence facility in the mid-1990s and completed approximately 2011. This Program was followed by a LEM Program at the Blenheim-Gilboa Power Plant, which was completed in 2013.*

*A LEM Program is currently ongoing at the Lewiston Pump-Generating Plant in Niagara. The Authority is now overhauling the 10th of 12 units, which are scheduled to be completed by 2022, with the entire program completion, with closeout, wrapping up in 2023.*

*The Transmission LEM Program is also underway. The Authority is extending the life of its transmission assets across all the regions, through 2025.*

*The next major investment is the LEM Program at the Robert Moses facility in Niagara, extending through 2034, which is estimated at \$1.1 billion.*

*Authority staff have put together a LEM Program to align with NYPA's asset management strategy and increased focus on enterprise resiliency. The scope of the Program is based largely on knowledge staff gained during the upgrade and standardization programs, recent maintenance data, experience, and information exchanged and provided through NYPA's participation with leading industry groups such as EPRI and CEATI. In addition, specialized testing and analysis conducted over the last two years on the machines enabled staff to capture critical design improvements and help refine the program cost and estimate.*

#### Project Scope

*The major components of the Project were broken down into four categories, namely:*

- 1) Replacement of the control systems which includes the complete replacement of the unit and plant controls as well as the modernization of the existing control room and construction of a new backup control room;*
- 2) The mechanical and electrical overhauls, which includes potential replacements of the Shafts, Wicket Gates, Head Covers, among other things; and*
- 3) The rehabilitation of the 630-ton Gantry Crane, which is vital to the success of this program.*
- 4) The penstock platform fabrication and inspection program.*

#### Penstock Platform

*Only the penstock platform fabrication, assessments and recoding of the penstocks are included in the scope at this time. Until a detailed assessment is performed, staff cannot quantify if there are any repairs needed. If any repairs are identified through the assessments, it will be performed under a separate contract, and, potentially, under a separate program, and brought to the Board for approval.*

*To this end, along with the first major capital funding request, two contract award approvals for the Penstock Platform and the Controls Upgrade are brought before the committee to recommend the full Board's approval at its meeting on July 30th.*

*The Penstock Platform Project includes the design, fabrication, assembly, and disassembly for each of the 13 Penstocks. It is estimated at \$69 million, and will be awarded to The State Group for a 14-year term. While The State Group was not the lowest-cost submitted, the evaluation team determined that the company's technical proposal provided the best value and the most sound and safest approach for platform construction and utilization.*

*The Controls upgrade, including options and escalation, estimated at \$134 million, will be awarded to Burns & McDonnell Consultants for a 14-year term. The scope of the contract includes the design, fabrication, installation of new digital integrated plant and unit controls, modernization of the existing control room, and construction of a new backup control room. While Burns and McDonnell Consultants was not the lowest cost bid submitted, the Evaluation team recognized the company's proposal as providing the best value and the best selection in terms of reaching the Authority's goal to be the first end-to-end digital utility. The proposal provides for a state-of-the-art control system, one used by many power plants worldwide, and also provides for software and hardware refresh through the life of the program, which was a lesson learned from previous programs.*

*The contract recommendations are the result of an extensive evaluation by NYPA staff in the selection of "best value" proposals in accordance with NYPA's procurement policy procedures.*

*The team conducted a series of qualitative and quantitative workshops to identify risks, assign risk owners, and confirm applicability. The \$121 million included is the unmitigated costs for those risks identified by conducting a simulation, calculating the minimum and maximum values, and ending at the 80 percentile, which staff is comfortable with, given the early stages of the program.*

*As part of the risk mitigation strategy, staff anticipates releasing work on each of the units in a phased approach to ensure that staff can incorporate lessons learned and ensure that continued investment in these assets makes sense over this long period.*

*To this end, staff is requesting approval for the first major capital funding release in the amount of \$213 million. Subsequently, staff intends to return to the Board four more times over the life of the program to align with the release of the next set of major contract awards and the release of major unit overhauls, and for any funding associated with contract negotiation terms such as escalation. Ms. Lombardi ended by saying that as the program progresses, any major changes to the cash flow and anticipated plan will be brought to the Board's attention.*

*Mr. Randy Kreuz, President of Customer Care Network, provided the business case for the Program. He said Customer Care Network did four essential analysis.*

*The first analysis was to look at what the effect of the LEM would be on customer preference rates. The cost of service is around \$15 per megawatt hour for customers; the market price is around \$30 per megawatt hour. Therefore, the customers are getting power for about 50 percent of market value. When the cost-of-service over the next 15 years to 2034 was projected, it remained the same. Even though prices are expected to rise over the next 15 years, the customers will still see rates that are only about half of the market value. Therefore, from a customer rate impact, even though the rates will go up because of the LEM, they are, relative to the market value, in about the same position.*

*The second was a discounted cash flow of the analysis. Not only is the program economic - around \$2.4 billion in that present value - the internal rate of return on it is around 40 percent. The company did various sensitivities considering "what if the project goes up in cost," "what if the discount rate is higher," and "what if timing changes," and it was very difficult to see this project not being economic.*

*The third thing the company looked at were some alternative projects -- conventional, combined-cycle and single-cycle, gas-fired units. They also looked at the cost, fully embedded, of both large-scale solar and large wind projects. In both instances, the Niagara project would be significantly more advantageous for the customers and is below market, as well. Based on the alternative projects that could be available to the customers, it is certainly worth NYPA simply proceeding with the LEM as designed.*

*The fourth analysis was a "cost benchmark." The company looked at similarly situated and similarly designed plants that were in the 50-, 60-, and 70-year-old range around the world and ended up with around 40 in the panel. They then looked at the cost data of the respective life extension and modernization programs. With this benchmark, they found that everyone was working on penstocks, turbines, switchyards and control systems. They also found that the Niagara LEM was around 20 percent lower in terms of overall cost than the overall panel. Again, this was another good point that, not only is the plant overwhelmingly economic from a Net Present Value perspective, but even when you look at alternative plants around the world that have done LEM programs, it stacks up very, very well.*

*Ms. Lombardi then provided an outline of the schedule and the five-year outlook. She said, as mentioned earlier, the first key milestones of this program are the awards for the controls upgrade and the penstock platform. The upgrade of the first unit controls is scheduled to commence in the fall of 2020 and to be completed in spring 2021. Modernization of the existing control room and construction of the*

*backup control room will take place at the same time, and also be completed in 2021. The tie-in of the upgraded controls will be completed as staff continue the unit controls throughout the years.*

*Staff anticipates the award of the remainder of the long-lead items, including gates and shafts, in the first part of 2020; delivery for the first unit LEM is scheduled in 2023. As laid out in the current schedule, staff will be able to complete two sets of unit controls by 2023.*

*Based on lessons learned staff has allotted a time, after monitoring the first unit's performance, before beginning work on the second unit. For the third outage, staff will be prepared to execute the electrical and mechanical controls concurrently with the unit controls upgrades. Each unit outage thereafter, starting with that third unit, is scheduled for approximately an eight-month outage window, which puts the program completion through 2034.*

On motion made by member John Koelmel and seconded by member Eugene Nicandri the Finance Committee approved staff's recommendation for the full Board's approval of a Life Extension and Modernization Program for the estimated cost of \$1.1 billion to modernize the Robert Moses Power Plant. In addition, the Finance Committee approved staff's recommendation for the full Board's approval of Capital expenditures in the amount of \$213 million; 14-year contract award in the amount of \$134 million to Burns & McDonnell Consultants, P.C. and a 14-year contract in the amount of \$58 million to The State Group.

**b. R.M. Flynn Power Plant - Long-Term Service and Extended Parts Agreement**

The President and Chief Executive Officer submitted the following report:

**“SUMMARY**

The Finance Committee is requested to recommend to the Trustees at their July meeting the award of a competitively bid, non-personal services, Operating Plant Service and Extended Parts Agreement contract to Siemens Energy Inc. of Orlando, Florida. This award will be in the amount of \$45 million for the R.M. Flynn Power Plant for a 20-year term or 100,000 Equivalent Operating Hours ('EOH'). The Siemens Energy Inc. contract will provide for all parts, labor, and upgrades in order to maintain the combustion turbine for the term of the agreement and labor and field for the first Steam Turbine minor and first Steam Turbine Major Inspections under this Agreement.

**BACKGROUND**

In accordance with the Authority's Guidelines for Procurement contracts and Expenditure Authorization Procedures, a term longer than one (1) year and in an amount in excess of \$6,000,000 requires approval by the Board of Trustees.

The Authority's R.M. Flynn Combined Cycle Power Plant was commissioned in April 1994 and the Authority currently has a maintenance service contract with Siemens Energy Inc. for the combustion and steam turbines. It is anticipated that by the fall of 2019, the majority of the combustion turbine's major components will reach the end of their useful life. In an effort to maximize the opportunity to optimize this facility site, management determined that it was prudent to rebid the maintenance service agreement.

**DISCUSSION**

Based upon projected run profiles, the recommended scope-of-work will include, but not be limited to, anticipated maintenance expenditures for the covered units through 2036, with a termination date of 20 years after effective date, July 31, 2019. At the contract start, Siemens Energy Inc. will provide all parts and services, (collectively "Work") necessary to upgrade the gas turbine, which will extend the existing 32,000 FFH maintenance intervals to 50,000 EOH, as well as increasing the combustion turbine output by 4.8 MW and improve plant heat rate (efficiency) by 1.06%. It is anticipated that Siemens Energy Inc. will perform the last maintenance on these covered units at 100,000 EOH (year 2036). As of year 2036, if the unit has not achieved the second major inspection ("MI"), NYPA has the option to either

- extend the contract until the 100,000 EOH maintenance milestone is reached,
- have Siemens perform the last maintenance event early, or
- end the term on the sunset date without performing the last maintenance event.

This contract will provide the Authority's R.M. Flynn Combined Cycle Plant the parts and resources to maintain the covered unit for a period of 100,000 EOH. This contract also transfers the risk of maintenance for the covered unit from the Authority to Siemens Energy Inc.

**FISCAL INFORMATION**

All costs incurred under this contract for the base scope-of-work will be expended through the O&M budget; any extra work incurred under this contract will be expended through the O&M and/or Capital budgets.

**RECOMMENDATION**

It is requested that the Finance Committee recommend that the Trustees authorize the award a 20-year (100,000 EOH) contract in the amount of \$45 million to Siemens Energy Inc. for the R.M. Flynn Long-Term Service and Extended Parts Agreement to become effective on or about July 31, 2019.”

On motion made by member John Koelmel and seconded by member Dennis Trainor the Finance Committee approved staff's recommendation for the full Board's approval of the award of an Extended Parts Agreement contract to Siemens Energy Inc. in the amount of \$45 million for a 20-year term, for the R.M. Flynn Power Project.

3. **Next Meeting**

Chairperson McKibben said that the next regular meeting of the Finance Committee would be held on November 20, 2019 at a time to be determined.

**Closing**

Upon motion made by member John Koelmel and seconded by member Michael Balboni, the meeting was adjourned by Chairperson McKibben at approximately 11:36 a.m.

*Karen Delince*

Karen Delince  
Corporate Secretary



NYPA-CANAL FINANCE COMMITTEE

**EXHIBITS**

**For**

**July 16, 2019**

**Meeting Minutes**



**NY Power  
Authority**

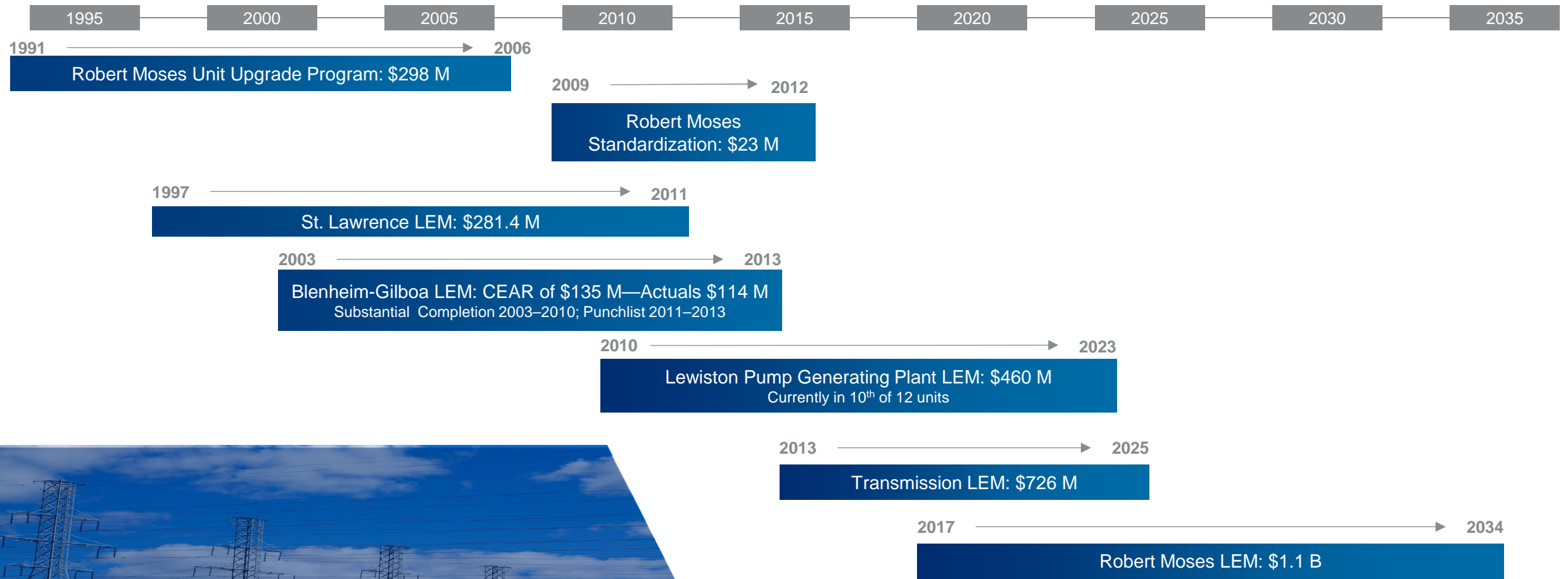
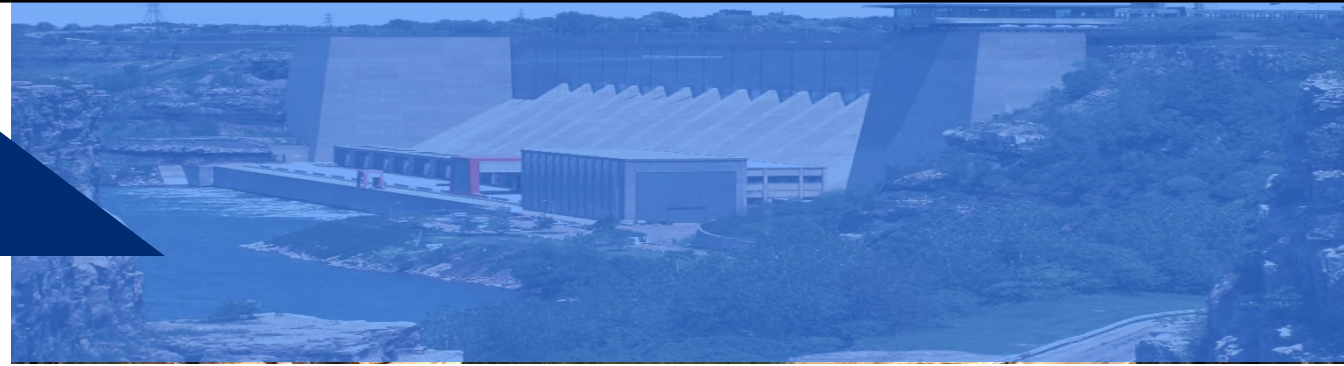
# Niagara Power Project

Robert Moses Life Extension and Modernization  
and Controls Upgrade Program

July 16, 2019



# NYPA LEM HISTORY



# PROJECT SCOPE



## Replace

- Wicket Gates
- Head Covers
- Stators
- Shafts
- Turbine Bearings & Housings
- Spiral and Scroll Case Hatches
- Bushings, O-rings, etc.

## Modernize

- Digital Controls System
- Digital Governors
- Static Exciter Digital Controllers
- Unit Instrumentation
- New Protection System
- AC/DC Power Panels
- Main and Backup Control Rooms

## Rehabilitate

- Turbine Runners and Seals
- Stay Rings
- Operating Mechanisms
- Rotor Rims and Spiders
- Thrust Bearings
- Servomotors
- 630T Crane Refurbishment
- Intermediate/ISO-phase Bus

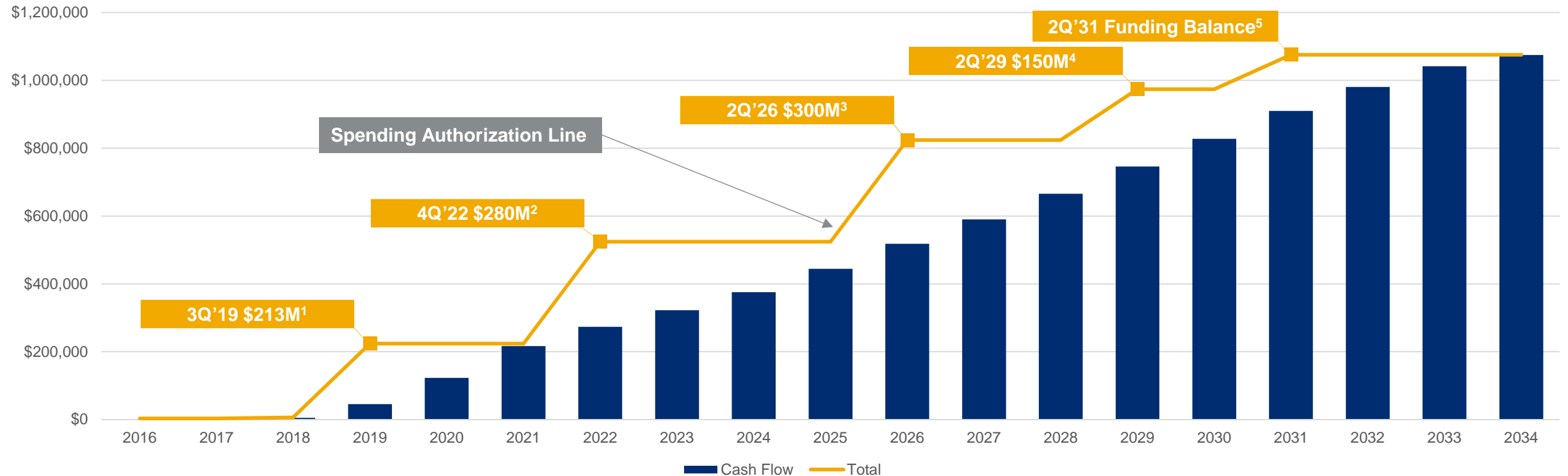
**Note:** High Pressure Fluid Filled (HPFF) Cable and Potheads, Generator Step-Up Transformers (GSUs), Unit Substations, Penstock Repairs are not in scope at this time (platform, inspections, painting/recoating included).

# PROJECT COST

	In \$ Millions
Preliminary Engineering	6
Engineering & Design	31
Procurement / Construction	546
NYPA Directs	43
NYPA Indirects	50
<b>Subtotal</b>	<b>\$676</b>
Risk Based Contingency	121
Escalation 3.5%/year	303
<b>Total Program</b>	<b>\$ 1,100</b>

# PROJECT CASH FLOW

## RM LEM Total Cash Flow (Dollars 1000's)



### <sup>1</sup>2019 | 1<sup>st</sup> Authorization

Units 1-3: Controls, Penstocks (w/ Platform), Long Lead Items; 630 Ton Crane Upgrades

### <sup>2</sup>2022 | 2<sup>nd</sup> Authorization

Units 4-6: Controls, Penstock, Long lead Items; Units 1-6 LEM; Contract changes and escalation

### <sup>3</sup>2028 | 3<sup>rd</sup> Authorization

Units 7-9: Controls, Penstock and LEM; Long Lead Items (Units 7-12); Contract changes

### <sup>4</sup>2030 | 4<sup>th</sup> Authorization

Units 8-12: Controls, Penstock and LEM; Contract changes and escalation

### <sup>5</sup>2032 | Final Authorization

Final Contract changes and escalation; Turnover and closeout

# JUSTIFICATION

Analysis	Summary Conclusion	Notes
<b>Customer Rate Impact</b>	Cost-based hydro rate remains significantly below forecasted market prices	<ul style="list-style-type: none"> <li>Fully loaded cost forecast (baseload capital, operating expenses, RM LEM included) ~50% less than Zone A Market</li> </ul>
<b>Discounted Cash Flow</b>	<u>Very</u> strong positive net present value (NPV)	<ul style="list-style-type: none"> <li>Total NPV at a 7.29% discount rate is \$2.35 billion</li> <li>Even with CES build out to meet 50x30 goal total NPV is \$2.0 billion</li> <li>If LEM costs converted to 2019 PV\$, project IRR is 40%</li> </ul>
<b>Alternative Projects</b>	Much lower cost	<ul style="list-style-type: none"> <li>Much lower cost compared to conventional simple- or combined-cycle</li> <li>Lower cost than large-scale wind or solar option</li> </ul>
<b>Cost Benchmark</b>	LEM is over 20% lower cost on a \$/kW basis than 39-plant panel*	<ul style="list-style-type: none"> <li>Cost compared to comparable hydro LEM projects in 17 different countries</li> <li>Lower cost than panel average (better)</li> </ul>

\*The business case study benchmarked the RM LEM \$/kW against 39 other power plants that have undertaken similar programs at their facility.

New York's goal is to meet 50% of its annual 160 TWh electric energy requirement from renewable resources by 2030, hence the term "50x30"



# FIVE-YEAR OUTLOOK

■ Controls LEM 
 ■ Mechanical LEM 
 ■ Penstock Inspection & Platform 
 ■ 630T Crane

2019	2020			2021		2022		2023
Q3	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q2-Q4
Program Approval	Award Wicket Gates & Shafts	Award 630T Crane Upgrades	Mech/Elec LEM: Award	Mech/Elec LEM: Design Starts	Penstock: 1 <sup>st</sup> Inspection	2 <sup>nd</sup> Unit Control Starts	Penstock: 2 <sup>nd</sup> Inspection	1 <sup>st</sup> Mech/Elec LEM
Penstock: Controls Award	Main Control Room Upgrades, Backup Control Starts		1 <sup>st</sup> Unit Controls Starts		1 <sup>st</sup> Unit Controls: Monitoring Period		630T Crane Upgrades complete	3 <sup>rd</sup> Unit Controls Starts
					Main Control Rooms Upgrade Complete, Backup Control room Build-out			Penstock: 3 <sup>rd</sup> Inspection