Saint Lawrence Seaway Development Corporation

Seaway Asset Renewal Program (ARP) Annual Report to Congress

Fiscal Year 2019

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Background and Summary

As requested in the Senate Report (S. Rept. 116-109) of S. 2520 (Transportation, Housing and Urban Development, and Related Agencies Appropriations Act, 2020), the Saint Lawrence Seaway Development Corporation (SLSDC or Corporation) is providing an annual report to the House and Senate Committees on Appropriations on the status of its infrastructure Asset Renewal Program (ARP).

The start of the ARP in 2009 represented the first time in SLSDC's 50-year history that a comprehensive effort had been undertaken to modernize the Seaway infrastructure, including rehabilitation of and improvements to the U.S.-operated locks, the navigation channels, the Seaway International Bridge, and other Corporation-owned facilities and assets located in Upstate New York. None of the ARP projects increases the authorized depth or width of the navigation channel or the size of the lock facilities.

The Seaway comprises perpetual assets (locks, channels, an international bridge, highway tunnel, and accompanying facilities and equipment), which require capital reinvestment to continue to operate safely, reliably, and efficiently. Without sufficient investment in the SLSDC's perpetual assets, the future availability and reliability of the U.S. section of the St. Lawrence Seaway would be at risk. Although the SLSDC has maintained a 99 percent reliability rate over its history, the ARP is currently necessary to continue accomplishing this level in the future.

Over its 60-year history, nearly 3 billion metric tons of cargo valued at more than $450 billion have moved through the St. Lawrence Seaway. This binational commercial transportation route impacts 237,000 U.S. and Canadian jobs and generates annual binational economic benefits of $35 billion in economic activity, $14.2 billion in personal income and local consumption expenditures, and $6.6 billion in Federal, state/provincial, and local tax revenue.[1]

In FY 2019, the SLSDC obligated $8.6 million on 28 capital projects as part of its ARP, including $1.5 million on paving and drainage infrastructure, $1.1 million to complete the installation of the hands-free mooring system at Snell Lock, and $1 million on heavy and light equipment purchases. Additionally, the SLSDC obligated and expended $1 million in personnel compensation and benefits (PC&B) in FY 2019 for ARP-related staff time.

Each year following enactment of the SLSDC's appropriation, Corporation engineering, maintenance, and program officials finalize its ARP internal spending plan to re-allocate funding, deferring and accelerating projects as needed. In addition, SLSDC officials are continually making ongoing internal budget adjustments throughout each fiscal year to ensure that current priority projects are funded. The flexibility to make the appropriate project and/or funding adjustments has been a major factor in the SLSDC's success in managing and implementing the program. While many ARP projects receive funding over several years, the SLSDC uses a multi-phased approach to develop each project to ensure annual funding produces usable, distinct, and tangible segments and avoids incremental funding, in accordance with OMB Circular A-11.

[1] *Economic Impacts of Maritime Shipping in the Great Lakes-St. Lawrence Region*, Martin Associates, July 2018.

Through the first 11 years of ARP funding (FYs 2009-2019), the SLSDC has spent $161 million on 55 separate projects *(see page 21)*. These projects included maintenance dredging in the U.S. portion of the Seaway navigation channel, lock miter gate and culvert valve machinery upgrades, culvert valve replacements, hands-free mooring installation at the locks, gatelifter upgrades, miter gate rehabilitation, and tugboat replacements, as well as various other structural and equipment repairs and/or replacement.

Since the ARP's inception, the SLSDC's procurement division, working with the agency's engineering team, recognized the need to be able to award ARP-related support contracts quickly. Pursuant to Federal Acquisition Regulation (FAR), Subpart 16.5, the SLSDC advertised on Federal Business Opportunities (FedBizOpps.gov) in FY 2015 for qualified architecture/ engineering (A/E) firms to support the ARP under an Indefinite Delivery Contract (IDC) for a base year with options for four additional years. Three firms received IDC awards in FY 2016 for these services – Bergmann Associates, Rochester, N.Y.; WSP USA, Inc., Buffalo, N.Y.; and NKB & RAM-TECH JV, Syracuse N.Y. The SLSDC currently uses these A/E contractors to receive design support and expert advice on project plans, specifications, and drawings for those ARP projects that require such external resources. As support work is needed, the SLSDC plans to request proposals from the three firms in a streamlined process, with negotiations, as required, limited to only those firms. The SLSDC has maintained IDCs with A/E firms since the start of the ARP in FY 2009 and expects to re-compete them in FY 2020.

The SLSDC's ARP closely coordinates with infrastructure renewal work completed or planned by the Canadian St. Lawrence Seaway Management Corporation (SLSMC). The Canadian Seaway locks along the St. Lawrence River are identical in age and design to those owned by the U.S. SLSDC. Together, the SLSDC and SLSMC have spent more than $500 million over the past five years (2015-2019) on asset renewal projects.

These significant investments clearly demonstrate the commitment of the United States and Canada to the long-term health and vitality of the binational waterway, complementing similar investments being made by many other Great Lakes Seaway System stakeholders, including ports, terminals, and carriers.

ARP Funding Update

Fiscal Year 2018 Funding – In March 2018, the SLSDC received its FY 2018 appropriation as part of the Consolidated Appropriations Act 2018 (P.L. 115-141). The SLSDC's appropriations for FY 2018 stated, in relevant part: "*…That of the amounts made available under this heading, not less than $19,500,000 shall be used on asset renewal activities and shall remain available through September 30, 2020.*"

Fiscal Year 2019 Funding – In February 2019, the SLSDC received its FY 2019 appropriation as part of the Consolidated Appropriations Act 2019 (P.L. 116-6). The SLSDC's appropriations for FY 2019 stated, in relevant part: "*…That of the amounts made available under this heading, not less than $16,000,000 shall be used on capital asset renewal activities*."

The following information provides an update on SLSDC ARP funding from the FY 2018 and FY 2019 appropriations acts:

ARP Funding from 2018 Appropriation (FYs 2018/2019/2020)	$19,650,000
ARP Obligations in FY 2018	($8,108,662)
ARP Obligations in FY 2019	($8,648,316)
ARP FY 2018 Funding Balance (as of 9/30/2019)	$2,893,022
ARP Funding from 2019 Appropriation	$16,000,000
ARP Obligations in FY 2019	($ 0)
ARP FY 2019 Funding Balance (as of 9/30/2019)	$16,000,000
Cumulative ARP Funding Balance	$18,893,022

FY 2019 ARP Project Updates

The following information provides an update on the 22 ARP projects with obligations in FY 2019 totaling more than $25,000.[2] The SLSDC continues to use contract vehicles that promote small and disadvantaged businesses as well as Federal contract programs offered by the General Services Administration (GSA), including e-Buy, AutoChoice, and the Federal Supply Schedule, whenever possible.

(1) Project No. 1: Both Locks – Upgrade Fendering on Approach Walls

General Description: This project is to replace wood fendering on the approach walls at both locks with rubber fenders to protect both the transiting vessels and the approach walls. The cost of the wood fenders is increasing such that the rubber fenders have become cost competitive. The rubber fenders that have been installed to date have performed well.

Mission Objective: Lock Operation Upgrade and Maintenance

FY 2019 Obligations: $190,258

Total Obligations *(FYs 2009-2019)*: $659,547

Project Update *(as of September 30, 2019)*: In FY 2019, the SLSDC made purchases for supplies and equipment necessary for the SLSDC workforce to complete repairs to damaged ship fendering at the two U.S. Seaway locks. Purchases included 400 feet of rubber wall fendering and 200 feet of rubber gate fendering from Kirti International, Galveston, Texas ($174,150); steel angle from J&S Steel, LLC, Plattsburgh, N.Y. ($8,303); and galvanized bolts and nuts from Fastenal Company, Winona, Minn. ($7,429). The fendering work is completed by the SLSDC maintenance workforce, and this is a regular and recurring project based on fendering damage and inventory needs. Most of the fendering purchased in FY 2019 is expected to be installed during FY 2020.

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(2) Project No. 7: Both Locks – Culvert Valves – Replace with Single Skin Valves

General Description: This project is for replacing the double skin culvert valves with single skin valves. Culvert valves are an integral component to a lock's filling and emptying system that control the flow of water through the navigation locks. Cracking of major structural members has occurred and the structural members are not accessible for inspection, blast cleaning, and painting given the double-skin construction. The culvert

[2] There were six ARP projects with FY 2019 obligations below $25,000 that are not reported in the project update section: Project No. 8: Floating Navigational Aids – Update/Replace ($20,996); Project No. 20: Both Locks – Upgrade Lock Status Controls ($11,242); Project No. 27: Corporation Facilities – Replace Windows and Doors and Repair Building Facades ($4,176); Project No. 30: Eisenhower Lock – Ice Flushing System – Upgrade ($7,082); Project No. 52: Corporation Facilities – Eisenhower Lock Visitors' Center – Replace ($129); and Project No. 59: Corporation Facilities – Communications Improvements ($5,394). In addition, the SLSDC reported miscellaneous ARP expenses not attributable to any specific project ($3,833).

valves are more than 50 years old and are corroding from the inside. The new single skin valves will provide access to the structural members for inspection and maintenance. The failure of a culvert valve would cause a delay to shipping while the damaged valve was removed and replaced.

Mission Objective: Lock Operation Upgrade and Maintenance

FY 2019 Obligations: $226,746

Total Obligations *(FYs 2009-2019)*: $2,596,281

Project Update *(as of September 30, 2019)*: Since the start of the ARP in FY 2009, the SLSDC has made significant investments in the culvert valves used for filling and emptying the locks during each transit. The double skin culvert valves were redesigned as single-skin valves. Over previous years, the SLSDC purchased eight of these improved valves (four in each lock).

In FY 2019, the SLSDC workforce installed all four single-skin culvert valves at Eisenhower Lock and identified the need for additional hydraulic control counterbalance valves to be installed for the new culvert valves to reduce vibrations during turbulent flows. To make this improvement, the SLSDC awarded a contract in FY 2019 to Bosch Rexroth Corporation, Bethlehem, Pa., for $62,037 to fabricate the hydraulic control upgrade equipment. The SLSDC workforce will install the new hydraulic control equipment on all eight single-skin valves in FY 2020.

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(3) Project No. 9: Corporation Equipment – Replace Heavy and Light Equipment, Maintenance Vehicles, and Shop Equipment

General Description: This is an ongoing program to replace heavy and light equipment, vehicles, and shop equipment as they become worn out and unserviceable. Heavy and light equipment include such items as a crane, dump truck, snowplow, backhoe, grader, front end loader, air compressor, forklift, and welder. Shop equipment includes such items as a lathe, drill press, vehicle hoist, and milling machine. Equipment and vehicles are inspected regularly and their replacement is prioritized based on the results of those inspections.

Mission Objective: Lock Operation Upgrade and Maintenance / Waterway Management

FY 2019 Obligations: $1,011,310

Total Obligations *(FYs 2009-2019)*: $4,079,101

Project Update *(as of September 30, 2019)*: In FY 2019, the SLSDC purchased work-related heavy and light equipment and motor vehicles for its Massena, N.Y., operations.

The vehicles purchased through the GSA Heartland Finance Center, Kansas City, Mo., totaled $134,258 and included two Dodge Ram 4x4 full-size pickup trucks, two Ford Transit cargo vans, and a Ford Transit Connect van. The SLSDC also purchased a Freightliner single cab vocational tractor from GSA for $137,675. The new single cab tractor replaces an old truck and is used for hauling heavy equipment around the SLSDC's facilities in Massena, N.Y.

The SLSDC also purchased a 45-ton all-terrain crane for $639,000 from The Empire Crane Company, LLC, North Syracuse, N.Y. The crane replaces the SLSDC's 25-year-old, 50-ton crane. The new crane will be used to access recess areas under the locks for maintenance and repairs and for removing and installing large lock equipment including ship arrestors and culvert valves.

Additionally, the SLSDC added two new Computer Numerical Control (CNC) tools for its tool shop in FY 2019 – a lathe and a vertical mill – for $77,492 from Phillips Corporation, Hanover, Md. CNC tools use a computer to control motors which position the machine resulting in improved machining accuracy, increased safety, and reduced setup-changeover time. Other small purchases in FY 2019 included lawn mowers, a 14-foot snow pusher, and a sliding table saw.

SLSDC's new CNC vertical milling machine

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(4) <u>Project No. 10</u>: Both Locks – Upgrade Power Supply Infrastructure from Moses-Saunders Dam to Both Locks and Adjacent Facilities

<u>General Description</u>: This project is for upgrading the infrastructure that supplies power to Eisenhower and Snell Locks and to the Corporation's Maintenance Facility. The power is furnished directly from the Moses-Saunders Power Dam over infrastructure that is 60 years old. The loss of power from the Moses-Saunders Power Dam would make it necessary to use diesel generators, which are expensive to operate, to continue operation of Eisenhower and Snell Locks and the Maintenance Facility. Additionally, the diesel generators will not provide enough power to support all lock and maintenance operations.

<u>Mission Objective</u>: Lock Operation Upgrade and Maintenance

<u>FY 2019 Obligations</u>: $147,920

Total Obligations <u>*(FYs 2009-2019)*</u>: $613,208

Project Update *(as of September 30, 2019)*: In FY 2019, the New York Power Authority (NYPA) continued its ongoing rehabilitation of the infrastructure that supplies power to the SLSDC for operations and maintenance activities. This is a recurring annual ARP project with expenditures dependent on NYPA plans. In FY 2019, the SLSDC paid $23,200 to NYPA, White Plains, N.Y., for its work on SLSDC power-related infrastructure rehabilitation, which included upgrade work on the main transmission lines coming to the SLSDC facilities, including new pole structures.

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(5) Project No. 11: Fixed Navigation Aids – Rehabilitate

General Description: This project is for rehabilitating fixed navigational aids in the Seaway. Many of the structures are almost 60 years old and are in need of more than routine repairs. Many of these structures have concrete bases that are partially underwater and have experienced varying degrees of damage from water, ice, and freeze-thaw cycles. Any repairs to the foundations will require divers as well as the use of a tug and barge with crane to complete. Failure of a fixed aid would likely make replacement necessary at a cost significantly higher than repairing the existing structure.

Mission Objective: Waterway Management

FY 2019 Obligations: $157,760

Total Obligations *(FYs 2009-2019)*: $315,476

Project Update *(as of September 30, 2019)*: In FY 2019, one of the SLSDC's fixed navigation aids (No. 199), located near Alexandria Bay, N.Y., was damaged and in need of repair. The SLSDC awarded a contract to Seaway Marine Group, LLC, Clayton, N.Y., for $149,999 to construct a new pier foundation and install a new steel platform for the light tower. The work is expected to be completed in early FY 2020 with the light re-commissioned for commercial navigation before the end of 2019.

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(6) Project No. 12: Corporation Equipment – Upgrade/Replace Floating Plant/Tugs

General Description: This project is for rehabilitating and/or replacing the Corporation's floating plant that is utilized for maintaining the locks and navigation channels. This multi-year project includes: replacing the SLSDC's tugboats *Robinson Bay* and *Performance*; upgrading the buoy tender barge; purchasing a boat to be used for hydrographic surveying with upgraded surveying equipment; purchasing a small boat for emergency response; purchasing small boats for navigation aid maintenance; purchasing a spud barge/scow for work on navigational aids and for emergency/spot dredging; and rehabilitating the SLSDC's crane barge/gatelifter *Grasse River*, which would have to be utilized if a miter gate were damaged and had to be replaced.

Mission Objective: Lock Operation Upgrade and Maintenance / Waterway Management

FY 2019 Obligations: $431,719[3]

Total Obligations *(FYs 2009-2019)*: $32,499,946

Project Update *(as of September 30, 2019)*: During FY 2019, the SLSDC issued several contract modifications totaling $246,739 to Gulf Island Shipyards, LLC, Houma, La., related to the construction of its new ice-class tugboat. In FY 2019, the name *Seaway Guardian* was selected for the new tug from a list of suggestions submitted by SLSDC employees. The tug name reflects the unique and significant role played by the SLSDC in supporting and protecting the Great Lakes St. Lawrence Seaway System.

SLSDC's Seaway Guardian tugboat performing tests at the Gulf Island Shipyards in Houma, La.

The new *Seaway Guardian* tugboat, 118 feet in length with a 45-foot beam (width), will replace the SLSDC's current tugboat *Robinson Bay* (built in 1958) and further enhance the SLSDC's ability to quickly and effectively respond to emergency operational incidents on the St. Lawrence Seaway. The new tug was designed to break up to 36 inches of ice while maintaining a speed of 3 knots. It will also possess enhanced ship firefighting capabilities and a command center onboard to improve communication and coordination during any emergency response. Following successful completion of sea trials, the tug will be delivered in mid-2020.

In addition, the new tug will achieve greater operational and cost-savings efficiencies, especially for buoy maintenance and retrieval/placement at the end and start of each navigation season. Unlike the *Robinson Bay*, the new tug will be equipped with a deck-mounted crane and sufficient deck space to pick and/or deploy up to three full-size buoys without the use of the buoy-tending barge. Finally, the new tugboat will produce lower emissions than the current boat.

The SLSDC obligated $333,827 in FY 2019 to the naval architect firm Glosten, Inc., Seattle, Wash., for the design of vessel to replace the SLSDC's smaller *Performance* tugboat. Following completion of the design in FY 2020, the SLSDC is expected to award a construction contract to a U.S. shipbuilder. The tugboat will carry out a variety of construction and maintenance duties for the U.S. portion of the St. Lawrence Seaway, including routine maintenance of lock gates, maintenance and positioning of aids to navigation, ice management, and removal of accumulated ice from lock walls.

[3] The obligations total for FY 2019 is "net" for the year and includes a credit/recovery of $350,000 from a prior year ARP obligation related to SLSDC buoy barge equipment.

(7) Project No. 14: Corporation Facilities – Replace Paving and Drainage Infrastructure

General Description: This project is for improving the pavement and drainage along lock approach walls as well as the roadways, public parking, and work areas at all Corporation facilities. In Upstate New York, the damage to pavements caused by winter conditions is significant.

Mission Objective: Lock Operation Upgrade and Maintenance / Facility-Equipment Upgrade and Maintenance

FY 2019 Obligations: $1,487,603

Total Obligations *(FYs 2009-2019)*: $3,695,863

Project Update *(as of September 30, 2019)*: In FY 2019, the SLSDC obligated $1.46 million to J.E. Sheehan Contracting Corporation, Potsdam, N.Y., to replace approximately 7,500 square yards of sub-base material and pavement and drainage improvements at the upper approach wall at Eisenhower Lock as well as the parking lot and entrance roadway for the Eisenhower Lock Visitors' Center. The work was completed in FY 2019.

Paving improvements at the north upstream approach wall at the SLSDC's Eisenhower Lock

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(8) Project No. 15: Eisenhower Lock Highway Tunnel – Rehabilitate

General Description: This is an ongoing project to maintain and upgrade the highway tunnel which goes through the upper sill area of Eisenhower Lock, providing the only access to the north sides of both Eisenhower and Snell Locks, to the New York Power Authority's Robert Moses Power Project, and to the New York State Park on Barnhart Island.

This project includes grouting to limit the water leaking into the tunnel, improving the drainage and replacing the roadway surface, upgrading the tunnel lighting, replacing damaged/missing tiles from the walls and ceiling, replacing deteriorated/damaged gratings and railings, stabilizing/repairing wing walls at the tunnel approaches, and clearing tunnel drains which are becoming plugged with concrete leachate products. Due to the fact that this tunnel is the only means of access to the facilities noted above, any problems that would make it necessary to close the tunnel for repair would have very significant impacts.

Mission Objective: Tunnel and Bridge Maintenance

FY 2019 Obligations: $34,013

Total Obligations *(FYs 2009-2019)*: $1,719,915

Project Update *(as of September 30, 2019)*: In FY 2019, the SLSDC awarded several contracts related to Eisenhower Lock tunnel improvements. Most significantly, the SLSDC installed a new heating system for the utility area above the tunnel replacing the old heating system that was inoperable. To complete the installation of the new heating system, the SLSDC awarded a contract to Global Equipment Company, Inc., Buford, Ga., for $7,820 for a new 480-volt blower/heater and to Graybar Electric Company, Inc., Syracuse, N.Y., for $6,318 for electrical equipment necessary for the heating system. In addition, the SLSDC awarded a contract to Ohio Grating, Inc., Canton, Ohio, for $3,748 for new heavy-duty roadway grating to be installed in the middle of the tunnel. Both the heating system and grating upgrades were completed by the SLSDC workforce in FY 2019.

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(9) Project No. 16: Upgrade GPS/AIS/TMS

General Description: This project is to expand the use of the Seaway's Global Positioning System (GPS)/ Automatic Identification System (AIS) navigation technologies, which are incorporated into the Seaway's binational Traffic Management System (TMS). Future upgrades will further improve the safety for vessels transiting the Seaway. Plans are to use these technologies to enable vessels to better identify hazards at times of limited visibility.

Mission Objective: Waterway Management

FY 2019 Obligations: $420,275

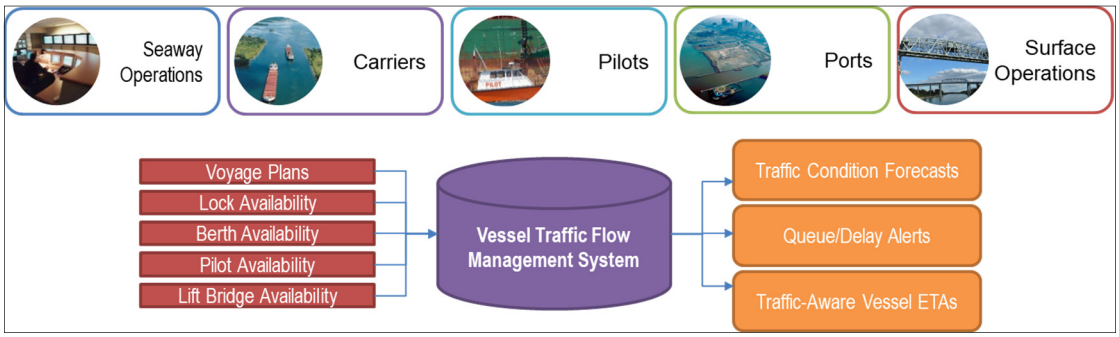
Total Obligations *(FYs 2009-2019)*: $624,294

Project Update *(as of September 30, 2019)*: In FY 2019, the SLSDC obligated $400,000 for Phase One feasibility and development work performed by the Volpe National Transportation Systems Center, Cambridge, Mass., on a new Vessel Traffic Flow Management System to be used by the Seaway's operators and users.

In 2017, the SLSDC and Canadian SLSMC worked with the Volpe Center and the Federal Highway Administration's (FHWA) Intelligent Transportation Systems Joint Program Office (ITS JPO) to study the idea of enhancing the Seaway's binational Traffic Management System (TMS) by utilizing a computer-based application to improve accuracy of estimated times of arrival (ETAs) for vessels, and enhance system efficiency and situational awareness.

The first phase funded in FY 2019 included vessel transit data analysis for the Montreal-Lake Ontario section of the Seaway, development of a presentation prototype, and initial discussions with the Seaway System's American, Canadian, and international stakeholder communities to include ports, carriers, and pilots. The Volpe Center will be preparing a Phase One final report to include project recommendations and next steps, which is expected to be completed by the end of FY 2020.

The U.S. and Canadian Seaway Corporations intend to pursue additional phases for this project, resulting in, at a minimum, a new system to improve the safety and efficiency of Seaway vessel traffic management, including transits and lockages. The system could be further enhanced to incorporate port, carrier, and pilot data to better inform and improve efficiencies in those extended Seaway stakeholder groups, like existing systems at European port regions.



Potential Seaway Vessel Traffic Flow Management System

The intention of all parties involved in this project is that the system development and implementation would be cost-shared by the SLSDC, Canadian SLSMC, and the Seaway carriers. This method of project funding was successful during previous Seaway technology improvements, including the development and production of the Seaway Automatic Identification System (AIS) traffic management system in the late 1990s/ early 2000s.

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(10) <u>Project No. 17</u>: Navigation Channels – Dredge U.S. Sectors to Maintain Design Grade and Dispose of Sediments

<u>General Description</u>: This project is for dredging of the U.S. Seaway navigation channel to remove sediment and to maintain the design grade for the channel bottom. Maintenance dredging areas include the intermediate pool (between Eisenhower and Snell Locks), the international tangent section to the east of Snell Lock, and several other sections of U.S. waters west of Eisenhower Lock. Funding will address high spots that still remain and silting that has occurred since the completion of earlier maintenance dredging projects, and SLSDC will also begin work on other sections of the St. Lawrence River under U.S. jurisdiction.

Mission Objective: Waterway Management

FY 2019 Obligations: $92,337

Total Obligations *(FYs 2009-2019)*: $8,233,390

Project Update *(as of September 30, 2019)*: The SLSDC awarded a contract in FY 2019 to Princeton Hydro, LLC, for $72,435 to perform environmental sampling, testing, and analysis of soil boring samples to identify any hazardous materials in the SLSDC intermediate pool between the two U.S. Seaway locks. The results of the sampling, testing, and analysis will be used to prepare the scope of work for the maintenance dredging work that is expected to be awarded in FY 2020.

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(11) Project No. 19: Corporation Facilities – Upgrade Electrical Distribution Equipment

General Description: This project is for upgrading electrical distribution equipment at both Eisenhower and Snell Locks and at the Maintenance Facility to ensure continued reliability. Much of this equipment is 60 years old.

Mission Objective: Lock Operation Upgrade and Maintenance / Facility-Equipment Upgrade and Maintenance

FY 2019 Obligations: $163,297

Total Obligations *(FYs 2009-2019)*: $1,467,114

Project Update *(as of September 30, 2019)*: In FY 2019, the SLSDC awarded a contract for $120,530 to CDG Engineers, Inc., St. Louis, Mo., to conduct a comprehensive electrical system study of Eisenhower Lock including arc flash hazard analyses, safety training, and recommendations for repairing or replacing deficient equipment. The results of the study are expected in FY 2020. Additionally, the SLSDC awarded a contract to Graybar Electric Company, Inc., Syracuse, N.Y., for $15,490 for stainless steel electrical panels to replace older equipment at Eisenhower Lock's south gallery. This is a regular replacement project due to the age and corrosion of electrical equipment underground in the lock galleries.

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(12) Project No. 23: Both Locks – Install Hands-Free Mooring System

General Description: This project is for installing the Hands-Free Mooring (HFM) system at both Eisenhower and Snell Locks to hold vessels in place while they are in the lock instead of using wire ropes deployed by the vessel's crew and placed on bollards on the lock wall by SLSDC personnel.

The HFM system uses vacuum pads, each of which provides up to 20 tons of holding force, mounted on vertical rails inside the lock chamber wall to secure the ship during the lockage process as it is raised or lowered while keeping it at a fixed distance from the lock wall. The last step in the lockage operation consists of releasing the vacuum and retracting the pads so that the vessel can sail safely out of the lock.

Once fully implemented at the U.S. and Canadian Seaway locks, the system will produce significant benefits involving workplace safety, carrier operating costs, transit efficiencies, and system competitiveness. The Canadian SLSMC initiated this project and began testing the new technology at their Welland Canal locks in 2007. SLSMC-funded testing led to a fourth-generation design, which includes three units with two vacuum pads on each unit, mounted in slots in the lock chamber wall. The SLSMC completed installation at its locks and the system was fully functional during the 2017 navigation season.

Mission Objective: Lock Operation Upgrade and Maintenance

FY 2019 Obligations: $1,142,835

Total Obligations *(FYs 2009-2019)*: $24,622,079

Project Update *(as of September 30, 2019)*: In FY 2019, the SLSDC successfully met its goal of completing the installation of the new HFM technology at both U.S. Seaway locks.

The Seaway's HFM project is the first use of this technology for an inland waterway to move commercial vessels through a lock system. The new technology allows commercial ships to transit safely and efficiently without the use of mooring lines while also enhancing workplace safety and improving operational efficiency.

Completed installation and commissioning of HFM at Snell Lock

Throughout FY 2019, the SLSDC worked with the HFM equipment manufacturer (Cavotec) and various contractors to complete the construction of the HFM system utility building, install the three vacuum pad units in the slots at Snell Lock, and test and commission the HFM system. These activities culminated with the official launch of the HFM system at Snell Lock on June 6, 2019. The SLSDC completed the installation and commissioning of the HFM system at Eisenhower Lock on September 19, 2018. During the 2019 season, 98.5 percent of commercial transits on the Seaway utilized the SLSDC's HFM system.

There were several contracts awarded and contract modifications issued during FY 2019 to complete the work at Snell Lock. These included:

- Dow Electric, Malone, N.Y., for $581,219 for the HFM equipment and control system installation at Snell Lock during the 2019 navigation season.
- Cavotec Canada, Markham, Ontario, Canada, and Cavotec USA, Mooresville, NC, for $123,488 to purchase software programming and spare parts that are specific to the HFM system and are only available from Cavotec.
- Optimation Technology, Inc., Rush, N.Y., for $22,033 for data collection and controls integration with the SLSDC's existing lock controls system at both locks.
- Airline Hydraulics Corporation, Bensalem, Penn., for $18,860 for bubbler equipment and hardware to install bubblers in the HFM slots at both locks to mitigate ice building.

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(13) Project No. 24: Both Locks – Structural Repair – Grout Leaks in Galleries and Recesses

General Description: This project is for grouting cracks/joints in the concrete in the galleries and recesses at both Eisenhower and Snell Locks to reduce the infiltration of water into these areas. Water leaking into these areas accelerates the corrosion of the components/machinery and makes it difficult to perform maintenance on these items.

Mission Objective: Lock Operation Upgrade and Maintenance

FY 2019 Obligations: $169,116

Total Obligations *(FYs 2009-2019)*: $210,727

Project Update *(as of September 30, 2019)*: The SLSDC awarded a contract to Emagineered Solutions, Inc., Redmond, Ore., for $162,885 to repair and grout cracks in the galleries and stair risers at both U.S. Seaway locks. This work marks the first time in over a decade that the grouting work will be completed in the galleries. The work on this project is expected to start in early FY 2020.

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(14) Project No. 28: Snell Lock – Walls, Sills, and Culverts – Rehabilitate Concrete

General Description: This project is to replace deteriorated/damaged concrete at Snell Lock in all areas except the diffusers. This includes concrete that has been damaged by freeze-thaw cycles and by vessel impacts. This deteriorated/damaged concrete includes the mass concrete that forms the locks walls, the walls, floors and ceilings of the filling and emptying culverts and the gate sills.

Mission Objective: Lock Operation Upgrade and Maintenance

FY 2019 Obligations: $357,500

Total Obligations *(FYs 2009-2019)*: $357,500

Project Update *(as of September 30, 2019)*: The SLSDC awarded a contract in FY 2019 to Patterson-Stevens, Inc., Tonawanda, N.Y., for $357,500 to replace 62 cubic yards of deteriorated concrete in the upstream culvert valve recesses and the north culvert areas at Snell Lock. The work awarded in FY 2019 is scheduled to be completed in FY 2020 following the conclusion of the 2019 navigation season.

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(15) Project No. 29: Eisenhower Lock – Walls, Sills, and Culverts – Rehabilitate Concrete

General Description: This project is to replace deteriorated/damaged concrete at Eisenhower Lock in all areas except the diffusers. This includes concrete that was of poor quality when placed during original construction and concrete that has been damaged by freeze-thaw cycles and by vessel impacts. This deteriorated/damaged concrete includes the mass concrete that forms the locks walls, the walls, floors and ceilings of the filling and emptying culverts and the gate sills.

Recessed concrete walls prepared for rehabilitation during the winter months of FY 2019

Mission Objective: Lock Operation Upgrade and Maintenance

FY 2019 Obligations: $309,217

Total Obligations *(FYs 2009-2019)*: $1,946,706

Project Update *(as of September 30, 2019)*: FY 2019 obligations for this project were principally related to SLSDC PC&B costs and supplies needed to complete 52 cubic yards of concrete rehabilitation work awarded to Shotcrete Montana, LLC, in FY 2018 for the four culvert valve recesses at Eisenhower Lock. The work was completed in FY 2019 during the winter months following the completion of the 2018 commercial navigation season. SLSDC crews completed demolition work, prepared the area, and installed the reinforced steel before the shotcrete process was performed by the contractor.

(16) Project No. 39: Both Locks – Dewatering Pumps – Upgrade Outdated Equipment

General Description: This project is for repairing/replacing several smaller pumps used for dewatering both Eisenhower and Snell Locks for maintenance of their underwater components. These pumps are almost 60 years old and parts for these units are no longer available. In recent years, the SLSDC began the replacement and/or repair of these pumps.

Mission Objective: Lock Operation Upgrade and Maintenance

FY 2019 Obligations: $153,295

Total Obligations *(FYs 2009-2019)*: $451,996

Project Update *(as of September 30, 2019)*: In FY 2019, the SLSDC awarded two contracts related to the dewatering pump controls at both locks. The first contract was awarded to Great Lakes Pump and Supply Company, Troy, Mich., for $40,750 for the new digital control equipment with a second contract awarded to Dow Electric, Inc., Malone, N.Y., for $106,000 to install the new controls. This project replaces the original equipment dating back to the start of Seaway operations in the late 1950s. The new equipment is expected to be installed in early FY 2020 and commissioned before the end of the 2019 commercial navigation season.

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(17) Project No. 41: Snell Lock – Install Ice Flushing System Technologies

General Description: This project is for completing the installation of an ice flushing system at Snell Lock similar to the one at Eisenhower Lock. The system will remove floating ice from the lock chamber to make room for transiting vessels and to prevent/minimize damage to the vessels and/or lock structures. Without this system, it is necessary to flush ice utilizing the filling valves which is less efficient and effective, significantly increases the stresses on these valves, and causes damage to them.

Mission Objective: Lock Operation Upgrade and Maintenance

FY 2019 Obligations: $661,764

Total Obligations *(FYs 2009-2019)*: $14,471,861

Project Update *(as of September 30, 2019)*: As reported in previous ARP annual reports to Congress, the SLSDC has experienced problems with the ice flushing system installed at Snell Lock in the winter of 2013. Since FY 2015, the SLSDC has worked with the contractors and design engineers involved with this project to resolve the system issues. Over the past few years, the SLSDC has worked with the parties to study and evaluate the operating problems and possible solutions.

Following a successful analysis, the SLSDC awarded a contract to Hohl Industrial Services, Inc., Tonawanda, N.Y., for $639,327 in FY 2019 for 28 34-inch modified knife gate valves and the installation of electric motor operators. The SLSDC anticipates installing the first four of these new reengineered valves in late 2019 and test them in early 2020. If testing is successful, the SLSDC expects to complete installation of all valves in late 2020 and have the system operable for the 2020 closing and 2021 opening.

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(18) Project No. 44: Both Locks – Ship Arrestor Machinery – Upgrade/Replace

General Description: This project is for replacing and, in some cases, upgrading the operating machinery for the ship arrestors at both Eisenhower and Snell Locks. The ship arrestors protect the miter gates from damage that would be caused should a vessel malfunction, making it unable to stop. This operating machinery is almost 60 years old and needs to be upgraded to ensure continued reliability.

Mission Objective: Lock Operation Upgrade and Maintenance

FY 2019 Obligations: $714,604

Total Obligations *(FYs 2009-2019)*: $714,604

Project Update *(as of September 30, 2019)*: In FY 2019, the SLSDC awarded a contract to Bosch Rexroth Corporation, Bethlehem, Pa., for $700,000 to upgrade the hydraulic machinery and controls for the ship arrestors at both locks. Each lock has two ship arrestors and require machinery and controls at each end of each arrestor. The eight hydraulic machinery/control units are expected to be installed prior to the start of the 2020 commercial navigation season.

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(19) Project No. 48: Both Locks – Stiffleg Derricks – Upgrade/Replace

General Description: This project is for upgrading the stiffleg derricks at both Eisenhower and Snell Locks. There is a stiffleg derrick located at each end of each lock. These are hoisting devices utilized to place the stoplogs, which are the temporary closure structures required for dewatering a lock for inspection and/or repair of the underwater components. These units are of riveted construction and are almost 60 years old.

Mission Objective: Lock Operation Upgrade and Maintenance

FY 2019 Obligations: $121,786

Total Obligations *(FYs 2009-2019)*: $121,786

Project Update *(as of September 30, 2019)*: The SLSDC awarded a contract in FY 2019 for $104,119 to N.K. Bhandari, Architecture and Engineering, P.C., Syracuse, N.Y., to perform a comprehensive inspection and structural evaluation of the four stiffleg derricks to determine any repairs or upgrades necessary to recertify the cranes. The inspection and evaluation is expected to be completed in the fall of 2019.

Additionally, the SLSDC awarded a contract to Rayco Wylie Systems, Hagerstown, Md., for $15,454 for new load indicators for each stiffleg derrick. Once the equipment is delivered, SLSDC crews will install the new load indicator equipment.

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(20) Project No. 61: Both Locks – Replace Recess Covers on Lock Walls

General Description: This is a multi-year project to replace steel and steel/concrete composite covers that are used to access the lock operating machinery located in the galleries and recesses at both locks. Many of these recess covers are original and will be over 60 years old when replaced. They have deteriorated due to the use of salt to keep the areas in which these covers are located clear of ice, and they have been damaged by trucks and heavy equipment driving over them. The SLSDC will replace them with more durable/maintainable materials designed for greater loads.

Mission Objective: Lock Operation Upgrade and Maintenance / Facility-Equipment Upgrade and Maintenance

FY 2019 Obligations: $255,252

Total Obligations *(FYs 2009-2019)*: $423,244

SLSDC's new traffic-rated culvert valve bulkhead slot gratings

Project Update *(as of September 30, 2019)*: The SLSDC awarded several contracts in FY 2019 to procure supplies and materials to fabricate recess covers for installation on the lock walls to restore and/or improve the load-carrying capacity of those covers and to keep water from damaging the lock operating equipment below. SLSDC crews fabricated and installed the covers.

In FY 2019, the SLSDC also addressed the replacement of the culvert valve bulkhead slot gratings located at both U.S. locks. Each lock has eight of these culvert valve bulkhead slots and the grating dates back several decades. The SLSDC identified a safety need to upgrade the bulkhead slot grating from standard grating to traffic-rated grating.

To complete this safety-related work, the SLSDC awarded a contract to Continental Construction, LLC, Gouverneur, N.Y., for $140,891 to replace the eight gratings at both locks with traffic-rated grating. The work is expected to be completed in early FY 2020.

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(21) <u>Project No. 65</u>: Both Locks – Install Lock Wall Guardrails

<u>General Description</u>: This project is to install new fall protection guardrails at the north walls of both Eisenhower and Snell Locks. It has been determined that employees are exposed to fall hazards when securing mooring lines during vessel transits through the locks. The guardrails will provide fall protection and will also be designed to support the structural loads and raise the working level of the secured mooring lines. Installing the guardrails should significantly increase safety for SLSDC employees by mitigating potential fall hazards and reducing strain/sprain injuries related to bending and kneeling while working at the lock walls.

SLSDC's new safety guardrails installed in FY 2019 on the south wall of Snell Lock

<u>Mission Objective</u>: Lock Operation Upgrade and Maintenance / Facility-Equipment Upgrade and Maintenance

<u>FY 2019 Obligations</u>: $192,617

<u>Total Obligations *(FYs 2009-2019)*</u>: $806,098

<u>Project Update *(as of September 30, 2019)*</u>: This project highlights the SLSDC's proactive approach to enhance the safety equipment and protocols for SLSDC workers and contractors. In FY 2015, SLSDC installed a new guardrail system along certain north wall areas at both U.S. Seaway locks. In FY 2019, the SLSDC awarded a contract to Dow Electric, Inc., Malone, N.Y., for $184,346 to assemble and install 3,600 linear feet of modular safety railings along both U.S. Seaway locks. The work contracted in FY 2019 completed the remaining areas on the north wall of both locks not completed in FY 2015 as well as the full length of the south side of the locks.

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(22) <u>Project No. 69</u>: Both Locks – Repair/Replace Corroded Piping and Malfunctioning Valves

<u>General Description</u>: This is a maintenance program to repair and/or replace air and water piping, fittings, valves, and monitoring equipment at Eisenhower and Snell Locks. The lock facilities have extensive air and water distribution systems that are continuously subject to corrosion damage. Repairs are needed to clean and paint or replace deteriorated piping and appurtenances to maintain these critical utilities.

Mission Objective: Lock Operation Upgrade and Maintenance

FY 2019 Obligations: $154,240

Total Obligations *(FYs 2009-2019)*: $154,240

Project Update *(as of September 30, 2019)*: The SLSDC awarded a contract in FY 2019 to Atlanta Gear Works, Inc., Dawsonville, Ga., for $151,374, to refurbish the flood control valve gear sets and stems used during dewatering of each U.S. Seaway lock following the end of each navigation season. The valves were experiencing instances of failure over the past few years due to age. The gear sets and stems were refabricated by the contractor, and SLSDC work crews anticipate completing the installation in early FY 2020.

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SLSDC Asset Renewal Program (ARP) Obligations (FYs 2009-2019)

ARP #	ARP Project Description	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014
1	Both Locks – Upgrade Fendering on Approach Walls	$245,494	$34,930	$0	$0	$0	$188,725
2	Both Locks – Rehabilitate Downstream Miter Gates	$0	$0	$3,548,985	$17,543	$3,033,060	$223,730
3	Both Locks – Rehabilitate Mooring Buttons, Pins, and Concrete Along Guidewalls and Guardwalls	$952,015	$51,501	$0	$395	$0	$0
4	Both Locks – Culvert Valve Machinery – Upgrade to Hydraulic Operation	$4,135,197	$441,150	$4,010,108	$609,971	$262,687	$4,602
5	Both Locks – Rehabilitate Winter Maintenance Lock Covers	$66,362	$19,470	$77,446	$69,380	$68,470	$88,636
6	Seaway International Bridge – Perform Structural Rehabilitation and Corrosion Prevention	$3,104,251	$5,680,775	$0	$0	$0	$0
7	Both Locks – Culvert Valves – Replace With Single Skin Valves	$2,155	$331,356	$111,059	$306,898	$8,745	$1,385,149
8	Floating Navigational Aids – Upgrade/Replace	$61,254	$54,576	$0	$0	$32,273	$68,149
9	Corporation Equipment – Replace Heavy and Light Equipment, Maintenance Vehicles, and Shop Equipment	$1,577,143	$488,592	$122,469	$81,623	$137,393	$227,151
10	Both Locks – Upgrade Power Supply Infrastructure from Moses-Saunders Dam to Both Locks and Adjacent Facilities	$19,594	$232,079	$97,979	$28,003	$17,099	$38,320
11	Fixed Navigational Aids - Rehabilitate	$66	$29,173	$18,454	$23,311	$33,397	$14,199
12	Corporation Equipment - Upgrade/Replace Floating Plant	$763,960	$1,638,737	$1,997,992	$2,189,954	$893,713	$609,459
13	Corporation Facilities - Replace Roofs	$146,481	$494	$9,740	$96,894	$45,240	$0
14	Corporation Facilities - Replace Paving and Drainage Infrastructure	$0	$1,839,051	$115,588	$0	$3,622	$0
15	Eisenhower Lock Highway Tunnel - Rehabilitate	$32,184	$284,465	$102,394	$9,020	$953	$1,164,656
16	Corporation Technologies - Upgrade GPS/AIS/TMS	$106,167	$83,232	($1,730)	$10,000	$6,350	$0
17	Navigation Channels - Dredge U.S. Sectors to Maintain Design Grade and Dispose of Sediments	$4,298,696	$13,359	$3,675,679	$118,885	$4,936	$465
18	Eisenhower Lock - Vertical Lift Gate - Replace Wire Ropes	$1,458	$496,528	$134,194	$311,286	$0	$0
19	Corporation Facilities - Upgrade Electrical Distribution Equipment	$0	$782,793	$379,980	$55,253	$2,687	$720
20	Both Locks - Upgrade Lock Status/Controls	$31,207	$162,661	$114,248	$134,044	$202,941	$157,659
21	Both Locks - Compressed Air Systems - Upgrade/Replace	$22,123	$828,924	$23,393	$2,792	$33	$0
22	Both Locks - Install Vessel Self Spotting Equipment	$0	$483	$0	$563	$3,975	$503,659
23	Both Locks - Install Hands-Free Mooring System	$0	$0	$0	$0	$0	$705,140
24	Both Locks - Structural Repair - Grout Leaks in Galleries and Recesses	$38,799	$0	$0	$2,812	$0	$0
25	Corporation Facilities - Upgrade/Replace Fire Alarm/Protection Systems	$25,409	$624	$31,298	$0	$0	$0
26	Corporation Facilities - Upgrade Storage for Lock Spare Parts and Equipment	$0	$421,778	$29,188	$143	$1,124,640	$32,475
27	Corporation Facilities - Replace Windows and Doors and Repair Building Facades	$0	$35,635	$8,725	$13,422	$4,715	$0
28	Snell Lock - Walls, Sills and Culverts - Rehabilitate Concrete	$0	$0	$0	$0	$0	$0
29	Eisenhower Lock - Walls, Sills, and Culverts - Rehabilitate Concrete	$0	$214,227	$0	$0	$452	$0
30	Eisenhower Lock - Ice Flushing System - Upgrade	$0	$0	$0	$0	$0	$0
31	Both Locks - Rehabilitate Upstream Miter Gates	$2,207,523	$2,497,234	$391,013	$47,113	$521	$0
32	Snug Harbor - Rehabilitate Spare Gate Storage and Assembly Area	$0	$13,661	$351,644	$16,692	$2,115,326	$94,340
33	Both Locks - Upgrade Drainage Infrastructure in Galleries and Recesses	$0	$0	$0	$542	$15,351	$314,642
34	Both Locks - Improve Ice Control	$0	$13,518	$0	$0	$0	$0
38	Both Locks - Upgrade/Replace Emergency Generators	$0	$0	$0	$0	$1,784,280	$380,327
39	Both Locks - Dewatering Pumps - Upgrade Outdated Equipment	$0	$0	$0	$196,196	$46,840	$33,905
41	Snell Lock - Install Ice Flushing System Technologies	$0	$1,453	$282,027	$11,548,762	$1,660,795	$139,238
42	Both Locks - Miter Gates - Structural Rehabilitation	$0	$0	$0	$9,940	$2,906,116	$3,758,337
43	Both Locks - Miter Gate Machinery - Upgrade/Replace	$0	$0	$133,901	$7,754	$3,256	$3,785,656
44	Both Locks - Ship Arrestor Machinery - Upgrade/Replace	$0	$0	$0	$0	$0	$0
48	Both Locks - Stiffleg Derricks - Rehabilitate	$0	$0	$0	$0	$0	$0
51	Corporation Facilities - Upgrade Physical Security to Meet HSPD-12 Requirements	$0	$26,656	$22,775	$365,896	$41,979	$24,852
52	Corporation Facilities - Eisenhower Lock Visitors' Center - Replace/Upgrade	$0	$0	$14,318	$0	$309,098	$815,730
53	Corporation Technologies - Upgrade Financial Management System	$0	$2,251	$3,576	$0	$0	$0
54	Corporation Facilities - Administration Building - Replace Elevator	$0	$0	$145,381	$0	$0	$0
55	Corporation Facilities - Maintenance Building - Replace Fuel Tanks	$0	$0	$192,277	$13,655	$0	$0
56	Corporation Facilities - Duty Free Store Property - Upgrade Security	$0	$0	$18,489	$0	$0	$0
57	Corporation Technologies - Upgrade Network Security	$0	$0	$170,633	$19,478	$8,687	$0
58	Corporation Facilities - Upgrades to Meet Sustainability and Energy Goals	$0	$0	$72,311	$82,641	$39,976	$28,678
59	Corporation Facilities - Communications Improvements	$0	$0	$0	$0	$0	$163
60	Both Locks - Improve Access to and Rehabilitate Machinery in Crossovers and Recesses	$0	$0	$0	$0	$0	$0
61	Both Locks - Replace Recess Covers on Lock Walls	$0	$0	$0	$0	$0	$0
65	Both Locks - Install Lock Wall Guardrails	$0	$0	$0	$0	$0	$0
69	Both Locks - Repair/Replace Corroded Piping and Malfunctioning Valves	$0	$0	$0	$0	$0	$0
71	Corporation Facilities - Facility and Underground Utilities Improvements	$0	$0	$0	$0	$0	$0
--	Miscellaneous Expenses (non project-specific expenses and administrative PC&B costs)	$113,774	$153,370	$160,384	$119,656	$97,762	$119,458
	ARP -- TOTAL OBLIGATIONS	**$17,951,311**	**$16,874,735**	**$16,565,915**	**$16,510,519**	**$14,917,365**	**$14,908,222**
--	Other Than Personnel ARP Costs (contracts, inventory, equipment, supplies)	$17,473,253	$16,186,390	$15,622,733	$15,719,149	$14,145,125	$14,070,068
--	SLSDC ARP Project-Specific Personnel Compensation and Benefits (PC&B)	$364,284	$534,975	$782,798	$671,714	$674,478	$718,696
--	Miscellaneous ARP Costs (non project-specific expenses and administrative PC&B costs)	$113,774	$153,370	$160,384	$119,656	$97,762	$119,458

SLSDC Asset Renewal Program (ARP) Obligations (FYs 2009-2019)

ARP #	ARP Project Description	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	TOTAL
1	Both Locks – Upgrade Fendering on Approach Walls	$140	$0	$0	$0	$190,258	$659,547
2	Both Locks – Rehabilitate Downstream Miter Gates	$0	$0	$0	$0	$0	$6,823,318
3	Both Locks – Rehabilitate Mooring Buttons, Pins, and Concrete Along Guidewalls and Guardwalls	$0	$0	$0	$0	$0	$1,003,911
4	Both Locks – Culvert Valve Machinery – Upgrade to Hydraulic Operation	$0	$0	$0	$0	$0	$9,463,715
5	Both Locks – Rehabilitate Winter Maintenance Lock Covers	$12,127	$0	$0	$0	$0	$401,891
6	Seaway International Bridge – Perform Structural Rehabilitation and Corrosion Prevention	$0	$0	$0	$0	$0	$8,785,026
7	Both Locks – Culvert Valves – Replace With Single Skin Valves	$177,157	$44,634	$2,382	$0	$226,746	$2,596,281
8	Floating Navigational Aids – Upgrade/Replace	$126,064	$1,969	$2,198	$190,544	$20,996	$558,023
9	Corporation Equipment – Replace Heavy and Light Equipment, Maintenance Vehicles, and Shop Equipment	$141,124	$18,486	$117,162	$156,648	$1,011,310	$4,079,101
10	Both Locks – Upgrade Power Supply Infrastructure from Moses-Saunders Dam to Both Locks and Adjacent Facilities	$0	$1,442	$7,572	$23,200	$147,920	$613,208
11	Fixed Navigational Aids - Rehabilitate	$26,638	$8,323	($43)	$4,198	$157,760	$315,476
12	Corporation Equipment - Upgrade/Replace Floating Plant	$318,600	$9,228,567	$9,826,516	$4,600,729	$431,719	$32,499,946
13	Corporation Facilities - Replace Roofs	$285,581	$34,852	($142)	$0	$0	$619,140
14	Corporation Facilities - Replace Paving and Drainage Infrastructure	$0	$0	$0	$250,000	$1,487,603	$3,695,863
15	Eisenhower Lock Highway Tunnel - Rehabilitate	$61,275	$30,955	$0	$0	$34,013	$1,719,915
16	Corporation Technologies - Upgrade GPS/AIS/TMS	$0	$0	$0	$0	$420,275	$624,294
17	Navigation Channels - Dredge U.S. Sectors to Maintain Design Grade and Dispose of Sediments	$21,771	$695	$0	$6,566	$92,337	$8,233,390
18	Eisenhower Lock - Vertical Lift Gate - Replace Wire Ropes	$0	$0	$0	$0	$0	$943,466
19	Corporation Facilities - Upgrade Electrical Distribution Equipment	$7,384	$0	$0	$75,000	$163,297	$1,467,114
20	Both Locks - Upgrade Lock Status/Controls	$173,819	$143,268	$68,326	$0	$11,242	$1,199,413
21	Both Locks - Compressed Air Systems - Upgrade/Replace	$4,381	$0	$0	$0	$0	$881,646
22	Both Locks - Install Vessel Self Spotting Equipment	$8,834	($63,174)	$6,839	$4,501	$0	$465,681
23	Both Locks - Install Hands-Free Mooring System	$10,795,599	$1,703,212	$8,205,661	$2,069,631	$1,142,835	$24,622,079
24	Both Locks - Structural Repair - Grout Leaks in Galleries and Recesses	$0	$0	$0	$0	$169,116	$210,727
25	Corporation Facilities - Upgrade/Replace Fire Alarm/Protection Systems	$0	$0	$0	$0	$0	$57,332
26	Corporation Facilities - Upgrade Storage for Lock Spare Parts and Equipment	$2,751	$0	$0	$0	$0	$1,610,975
27	Corporation Facilities - Replace Windows and Doors and Repair Building Facades	$2,655	$0	$0	$0	$4,176	$69,327
28	Snell Lock - Walls, Sills and Culverts - Rehabilitate Concrete	$0	$0	$0	$0	$357,500	$357,500
29	Eisenhower Lock - Walls, Sills, and Culverts - Rehabilitate Concrete	$0	$0	$817,884	$604,926	$309,217	$1,946,706
30	Eisenhower Lock - Ice Flushing System - Upgrade	$0	$0	$0	$0	$7,082	$7,082
31	Both Locks - Rehabilitate Upstream Miter Gates	$0	$0	$0	$0	$0	$5,143,404
32	Snug Harbor - Rehabilitate Spare Gate Storage and Assembly Area	$4,295	$0	$0	$0	$0	$2,595,958
33	Both Locks - Upgrade Drainage Infrastructure in Galleries and Recesses	$743	$0	$0	$0	$0	$331,278
34	Both Locks - Improve Ice Control	$28	$0	$0	$0	$0	$13,545
38	Both Locks - Upgrade/Replace Emergency Generators	$63,406	$1,334	$0	$0	$0	$2,229,347
39	Both Locks - Dewatering Pumps - Upgrade Outdated Equipment	$21,759	$0	$0	$0	$153,295	$451,996
41	Snell Lock - Install Ice Flushing System Technologies	$162,233	$11,096	$3,173	$1,320	$661,764	$14,471,861
42	Both Locks - Miter Gates - Structural Rehabilitation	$8,372	$0	$0	$0	$0	$6,682,765
43	Both Locks - Miter Gate Machinery - Upgrade/Replace	$1,644,855	$76,166	($270)	$0	$0	$5,651,318
44	Both Locks - Ship Arrestor Machinery - Upgrade/Replace	$0	$0	$0	$0	$714,604	$714,604
48	Both Locks - Stiffleg Derricks - Rehabilitate	$0	$0	$0	$0	$121,786	$121,786
51	Corporation Facilities - Upgrade Physical Security to Meet HSPD-12 Requirements	$4,065	$0	$0	$0	$0	$486,225
52	Corporation Facilities - Eisenhower Lock Visitors' Center - Replace/Upgrade	$9,479	$2,183	($768)	$0	$129	$1,150,167
53	Corporation Technologies - Upgrade Financial Management System	$0	$0	$0	$0	$0	$5,827
54	Corporation Facilities - Administration Building - Replace Elevator	$0	$0	$0	$0	$0	$145,381
55	Corporation Facilities - Maintenance Building - Replace Fuel Tanks	$0	$0	$0	$0	$0	$205,932
56	Corporation Facilities - Duty Free Store Property - Upgrade Security	$0	$0	$0	$0	$0	$18,489
57	Corporation Technologies - Upgrade Network Security	$0	$0	$0	$0	$0	$198,798
58	Corporation Facilities - Upgrades to Meet Sustainability and Energy Goals	$37,414	$12,348	($271)	$0	$0	$273,097
59	Corporation Facilities - Communications Improvements	$35,847	$40,561	$36,453	$0	$5,394	$118,419
60	Both Locks - Improve Access to and Rehabilitate Machinery in Crossovers and Recesses	$724,686	$15,360	$0	$0	$0	$740,045
61	Both Locks - Replace Recess Covers on Lock Walls	$23,805	$38,375	$35,489	$70,323	$255,252	$423,244
65	Both Locks - Install Lock Wall Guardrails	$593,802	$19,680	$0	$0	$192,617	$806,098
69	Both Locks - Repair/Replace Corroded Piping and Malfunctioning Valves	$0	$0	$0	$0	$154,240	$154,240
71	Corporation Facilities - Facility and Underground Utilities Improvements	$0	$0	$0	$51,076	$0	$51,076
--	Miscellaneous Expenses (non project-specific expenses and administrative PC&B costs)	$70,158	$28,908	$855	$0	$3,833	$868,158
	ARP -- TOTAL OBLIGATIONS	**$15,570,849**	**$11,399,239**	**$19,129,017**	**$8,108,662**	**$8,648,316**	**$160,584,149**
--	Other Than Personnel ARP Costs (contracts, inventory, equipment, supplies)	$14,842,669	$10,892,561	$18,705,524	$7,848,121	$7,613,157	$153,118,749
--	SLSDC ARP Project-Specific Personnel Compensation and Benefits (PC&B)	$658,022	$477,770	$422,638	$260,541	$1,031,326	$6,597,242
--	Miscellaneous ARP Costs (non project-specific expenses and administrative PC&B costs)	$70,158	$28,908	$855	$0	$3,833	$868,158