



**COMMISSION
AGENDA MEMORANDUM**

Item No. 6h

ACTION ITEM

Date of Meeting December 10, 2019

DATE: November 25, 2019

TO: Stephen P. Metruck, Executive Director

FROM: Jeffrey Brown, Director Aviation Facilities and Capital Programs
Wayne Grotheer, Director, Aviation Project Management

SUBJECT: Building Controls Upgrade (CIP #C800944) – Design

Amount of this request: \$2,950,000

Total estimated project cost: \$10,000,000

ACTION REQUESTED

Request Commission authorization for the Executive Director to (1) prepare design and construction bid documents for the Building Controls Upgrade Project at Seattle-Tacoma International Airport; and (2) use port crews for preconstruction activities. The amount of this request is \$2,950,000 of an estimated total project cost of \$10,000,000.

EXECUTIVE SUMMARY

The building control system regulates and controls critical airport terminal building environmental features such as temperature, humidity, and air exchanges. This project will replace approximately 100 obsolete building control panels that are installed throughout concourses B, C, and D. This project will also improve communications and data throughput allowing for improved system performance and future system expansion.

The estimated cost to complete this project has increased significantly from the estimate included in the 2020-2024 capital budget and plan of finance due to cost increases on the original scope and additional scope to double the number of control panels and to replace communications copper cable backbone with fiber optic cable.

JUSTIFICATION

The panels that will be replaced as part of this project are integral components in the Direct Digital Control (DDC) system throughout the airport. The DDC system was installed circa 1990s and is responsible for monitoring and controlling mechanical equipment at the airport. The equipment includes the Heating, Ventilation, and Cooling (HVAC), chilled water, hot water, preconditioned air, and natural gas distribution.

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The existing control panels have reached obsolescence; the components are experiencing intermittent failures and replacement parts are difficult to obtain as they are no longer manufactured. Any operational loss of the control panels has a direct effect on the operation of the airport and a negative impact to customer experience. Since the installation of the DDC system, there have been significant improvements in control panel technologies that increase the reliability, reduce the size of equipment, and improve the processing capacity. This project will take advantage of the latest technology and give the port the opportunity to rebalance the panels to provide space for planned future projects. The control panels will be purchased under the sole-source agreement with Siemens 2015-013.

The DDC system is connected and controlled on an independent copper cable backbone that keeps it isolated from any outside connections. This network has reached its performance limitations. During heavy demand periods, the system has increased latency, resulting in slow adjustment to the system needs. At times, if the data transfer requirement exceeds the network capacity, data can be lost, resulting in disruptions of service. This existing communications backbone cabling will be upgraded to fiber optic cable allowing for higher data throughput, increased reliability, and future expansion.

Diversity in Contracting

The project staff, in coordination with the Diversity in Contracting department, have set a seven percent woman- and minority-owned business enterprise (WMBE) aspirational goal for this design contract.

DETAILS

This project will replace 100 obsolete control panels that are distributed throughout Concourses B, C, and D. The existing equipment and field control points will remain in place and be migrated to the new panel hardware. As panels are being updated, the whole panel load and spacing will be reviewed, and configured where possible to add capacity for future expansions.

A fiber backbone will be installed in parallel with the existing copper backbone. Planned shutdowns will transition the network off the copper and onto the new fiber backbone. The obsolete copper backbone will be removed. This fiber network will connect the existing fiber on Concourse A and Main Terminal, with Concourses B, C, and D. Both the north and south satellites already have fiber runs in place that connect to the DDC system.

Scope of Work

The scope of work for this project includes:

- (1) Replacing 100 obsolete control panels.
- (2) Connecting the new control panels to the DDC system.
- (3) Provide wiring, testing, commissioning, and associated equipment for a fully functional system.

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- (4) Salvage components from the obsolete control panels and add these parts to the port’s spare parts inventory.
- (5) Install a new fiber backbone to connect the new and previously upgraded control panels to the DDC network.
- (6) Provide fiber optic wiring, terminations, testing, commissioning, and associated equipment for a fully functional system.

Schedule

Activity

Design start	2020 Quarter 3
Commission construction authorization	2021 Quarter 2
Construction start	2021 Quarter 3
In-use date	2022 Quarter 3

Cost Breakdown

	This Request	Total Project
Planning and Design Phase	\$2,950,000	\$3,000,000
Construction and Closeout Phase	\$0	\$7,000,000
Total	\$2,950,000	\$10,000,000

ALTERNATIVES AND IMPLICATIONS CONSIDERED

Alternative 1 – Do not proceed with the replacement project.

Cost Implications: \$22,000 would need to be expensed

Pros:

- (1) No capital investment required at this time.

Cons:

- (1) Panel failure will have a negative effect on the passenger and tenant experience at the airport.
- (2) Future projects will be limited on expansion capabilities until the panels and fiber network are replaced.
- (3) Future projects will be required to replace panels, adding time, complexity, and cost to the scope.
- (4) Replacing panels on a project-by-project basis will increase the unit cost of the panel replacement.
- (5) The fiber network will not be extended into Concourses B, C, and D.
- (6) The issue of intermittent data loss will not be addressed.

This is not the recommended alternative.

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Alternative 2 – Replace the obsolete control panels only.

Cost Implications: \$6,500,000

Pros:

- (1) Lower capital investment.
- (2) Replaces the obsolete equipment and failing control panels.

Cons:

- (1) The existing copper backbone will limit the expansion capabilities of the control panels and the ability to add additional panels required by future projects.
- (2) The fiber network will not be extended into Concourses B, C, and D.
- (3) The issue of intermittent data loss will not be addressed.
- (4) Not extending the fiber network will limit the technological gains of the upgraded control panels.

This is not the recommended alternative.

Alternative 3 – Replace the obsolete control panels and install the fiber backbone.

Cost Implications: \$10,000,000

Pros:

- (1) Replaces obsolete equipment and failing control panels.
- (2) Extends the fiber network into Concourses B, C, and D.
- (3) Provides infrastructure for future projects with greater data requirements and future panels.
- (4) Mitigates existing data capacity issues on the copper backbone.

Cons:

- (1) This is the highest capital investment.

This is the recommended alternative.

FINANCIAL IMPLICATIONS

Cost Estimate/Authorization Summary

	Capital	Expense	Total
COST ESTIMATE			
Original estimate	\$4,976,000	\$128,000	\$5,104,000
Current change	\$4,903,000	(\$7,000)	\$4,896,000
Revised estimate	\$9,879,000	\$121,000	\$10,000,000
AUTHORIZATION			
Previous authorizations	\$50,000	0	\$50,000
Current request for authorization	\$2,829,000	\$121,000	\$2,950,000
Total authorizations, including this request	\$2,879,000	\$121,000	\$3,000,000
Remaining amount to be authorized	\$7,000,000	\$0	\$7,000,000

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Annual Budget Status and Source of Funds

This project, CIP C800944, was included in the 2020-2024 capital budget and plan of finance with a budget of \$4,976,000. A budget increase of \$4,903,000 was transferred from the Aeronautical Reserve CIP (C800753) resulting in zero net change to the Aviation capital budget. The funding source will be the Airport Development Fund and future revenue bonds.

The original project request submitted in 2016 only included 49 panels that had reached obsolescence. From that initial request an additional 50 panels have been identified as needing replacement. Additionally, the current copper backbone has now reached its data limitations. The project cost increase is due to the delay in executing the original 2016 project, the increase of 50 additional obsolete panels, and the need for increased data on the backbone.

Financial Analysis and Summary

Project cost for analysis	\$10,000,000
Business Unit (BU)	Terminal Building
Effect on business performance (NOI after depreciation)	NOI after depreciation will increase due to inclusion of capital (and operating) costs in airline rate base.
IRR/NPV (if relevant)	N/A
CPE Impact	\$0.03 in 2024

ATTACHMENTS TO THIS REQUEST

- (1) Presentation slides

PREVIOUS COMMISSION ACTIONS OR BRIEFINGS

None