

PORT OF SEATTLE
MEMORANDUM

COMMISSION AGENDA
ACTION ITEM

Item No. 4e
Date of Meeting April 14, 2015

DATE: April 6, 2015
TO: Ted Fick, Chief Executive Officer
FROM: Dave Soike, Director, Aviation Facilities and Capital Program
Wayne Grotheer, Director, Aviation Project Management Group
SUBJECT: Combined Communication and Command Center (C4) Uninterruptible Power Supply (UPS) System Improvements (CIP #800107)

Amount of This Request: \$832,000 **Source of Funds:** Airport Development Fund (ADF)
Est. Total Project Cost: \$4,555,238
Est. State and Local Taxes: \$247,000

ACTION REQUESTED

Request Commission authorization for the Chief Executive Officer to design and prepare construction bid documents for the Combined Communication and Command Center (C4) Uninterruptible Power Supply (UPS) System Improvements project at Seattle-Tacoma International Airport. This authorization is for \$832,000 of a total estimated project cost of \$4,555,238.

SYNOPSIS

This authorization would allow for the design required to replace the obsolete and failing C4 UPS System. The C4 UPS system provides power to a variety of life-safety, security, and operationally critical applications in case of a power failure. These include the 911 Center, the Airport Communications Center, and the 800MHz Radio System, which provides airport-wide communications for Port of Seattle Police, Fire Department, Maintenance, and Airport Operations. This project will replace aging batteries, upsize the current system in order to meet future demand, and remove the single point of failure that is currently in the system in order to assure redundancy to these critical systems. The 911 Center requires constant backup power as a requirement to maintain certification as an Association of Public-Safety Communication Officials (APCO) 911 Center. This project was included in the 2015-2019 capital budget and plan of finance.

BACKGROUND

The existing C4 UPS power distribution system requires modification due to obsolescence and design deficiencies. The system includes two battery banks and two UPSs to provide redundancy, but has experienced failures in both UPSs and both battery banks due to the UPSs'

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and batteries' being beyond their useful lives. Recent tests have revealed one of the existing battery banks is dead and is currently being replaced as an expense item (approximately \$200,000) to keep the system functional until the entire system can be replaced. The existing batteries operate at a voltage that is not an industry standard; therefore, the replacement batteries may not be able to be incorporated into the system upgrade. The automatic power switching system does not function properly and cannot be corrected through repair as critical parts are no longer available. The system also lacks redundant power paths to allow portions of the system to be de-energized without affecting critical airport functions. Crucial equipment suppliers for the existing system have gone out of business. The only way to correct the C4 problems is to redesign and replace portions of the power distribution system. Failure rates for this system are becoming increasingly frequent.

PROJECT JUSTIFICATION AND DETAILS

Project Objectives

The project objective is to increase the reliability of the C4 UPS Power Distribution System by replacing obsolete equipment, eliminating single points of failure, and provide redundant power feeders. The project will be designed as a highly reliable system to back-up critical life-safety, security, and business critical operations including the 911 Center, Airport Communications Center, and the 800 MHz Radio System. The design will have no single points of failure upstream of the Power Distribution Units.

Scope of Work

The scope of work for this project includes:

- Demolish and replace existing UPSs, paralleling cabinets, batteries, Automatic Transfer or Static Switches
- Provide wiring, testing, commissioning and associated equipment for a fully functional system with no single points of failure upstream of the power distribution units.
- Add Power Connection Box, Power Monitoring Equipment, Remote Monitoring, and Power System Filters.
- Provide rack mount automatic transfer switches or replace with static transfer switches (varies depending on final design); and
- Upgrade fire protection system.

Schedule

Project Notebook Approval:	4 th Quarter 2014
Commission Authorization for Design:	2 nd Quarter 2015
Design Start:	2 nd Quarter 2015
Design Completion:	4 th Quarter 2015
Commission Authorization for Construction:	4 th Quarter 2015
Construction:	4 th Quarter 2015 through 1 st Quarter 2017

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FINANCIAL IMPLICATIONS

<i>Budget/Authorization Summary</i>	Capital	Expense	Total Project
Original Budget	\$2,052,000	\$0	\$2,052,000
Budget Increase (September 2014)	\$2,154,471	\$348,767	\$2,503,238
Revised Budget	\$4,206,471	\$348,767	\$4,555,238
Previous Authorizations (Original Scope)	\$1,987,233	\$348,767	\$2,336,000
Current request for authorization	\$0	\$0	\$0
Total Authorizations, including this request	\$1,987,233	\$348,767	\$2,336,000
Remaining budget to be authorized	\$2,219,238	\$0	\$2,219,238
Total Estimated Project Cost	\$4,206,471	\$348,767	\$4,555,238

<i>Project Cost Breakdown</i>	This Request	Total Project
Design	\$832,000	\$1,330,238
Construction	\$0	\$2,978,000
Sales Tax	\$0	\$247,000
Total		\$4,555,238

Budget Status and Source of Funds

This project, C800107, was included in the 2015-2019 capital budget and plan of finance at an estimated cost of \$4,555,238. This project previously received project-wide authorization in 2007. The C4 UPS System was redesigned at that time, but a decision was made to delay moving forward with construction due to budget constraints resulting from an economic downturn. It has been determined that only 30% of the previous design work is now usable. Consequently, \$348,767 was written off to expense in 2014. The amount needed to complete the design is estimated to be an additional \$832,000. Given the amount of time that has passed since the original authorization in 2007, staff is returning to Commission to seek authorization to proceed with design. The funding sources include the Airport Development Fund and future revenue bonds. The Port plans to issue revenue bonds in 2015 to fund a number of projects.

Staff will return in Q4 2015 to request the construction authorization needed to complete the project.

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Financial Analysis and Summary

CIP Category	Renewal/Enhancement
Project Type	Renewal & Replacement
Risk adjusted discount rate	N/A
Key risk factors	N/A
Project cost for analysis	4,555,238
Business Unit (BU)	Admin (costs allocated to all cost centers)
Effect on business performance	NOI after depreciation will decrease
IRR/NPV	N/A
CPE Impact	\$.01 in 2017

Lifecycle Cost and Savings

The replacement of the existing Uninterruptable Power System will decrease the risk of unforeseen failures of obsolete equipment that can impact critical operations at the Airport; however, the replacement will not appreciably decrease the number of preventative maintenance activities performed on the system. Weekly UPS testing is required for 911 certification.

STRATEGIES AND OBJECTIVES

This project supports the Port's Century Agenda Objective of meeting the region's air transportation needs at Sea-Tac Airport for the next 25 years. Maintaining our existing assets and infrastructure is necessary to meeting this objective.

ALTERNATIVES AND IMPLICATIONS CONSIDERED

Alternative 1) – Maintain status quo.

Capital Cost: \$0; increased maintenance expense

Pros:

The Port could delay expenditure of the cost of system design and replacement, using the funds for other purposes.

Cons:

Maintaining status quo is not a feasible option. The existing system would fail and put the Port at unnecessary risk by not having the code-required uninterruptable power supply to back up critical life/safety, airport operations and business functions. Without a reliable UPS system, the Port would lose its 911 certification and would be forced to back out of agreements with local police and fire departments.

Alternative 2) – Replace both battery banks, both uninterruptable power supplies and static switches in kind, without upsizing equipment or reconfiguring the system to provide redundant power feeders and thereby eliminating single points of failure.

Cost: \$4,064,238

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Pros:

This option would save \$491,000 and take a month off the project schedule.

Cons:

This option would leave the system lacking the redundancy required to ensure adequate support of critical airport functions. This alternative would leave a single point of failure within the system, which means in the event of an equipment failure, there would be no way to bypass the failure and connect to the emergency generator. This option leaves emergency communications such as 911 vulnerable to extended outage, and leaves the system undersized for current and future needs.

Alternative 3) – Upsize and replace both battery banks, both uninterruptable power supplies, and static switches, without reconfiguring the system to provide redundant power feeders and eliminating single points of failure.

Cost: \$4,147,238

Pros:

This option would save \$408,000 and take a month off the project schedule. Alternative 3 is similar to Alternative 2 above, but this option upsizes the system to meet current and future demands.

Cons:

Similar to Alternative 2 above, this option would leave the system lacking the redundancy required to support critical airport functions. Alternative 3 leaves a single point of failure within the system, which means in the event of an equipment failure, there would be no way to bypass the failure and connect to the emergency generator. Failure within the system without redundancy to bypass takes a minimum of several hours and up to several months to correct, leaving the Port and surrounding areas without emergency communications until corrected.

Alternative 4) – Redesign system and increase reliability by replacing obsolete equipment, increasing capacity by upsizing equipment, eliminating single points of failure, and providing redundant power feeders.

Cost: \$4,555,238

Pros: This option would result in a redundant system capable of supporting emergency communications for critical airport functions in the event of power outage or equipment failure.

Cons: This is the most expensive project alternative and requires one to two additional months to complete.

The recommendation is to pursue Alternate 4. This option replaces current obsolete equipment with new equipment sized properly for current and future needs and reduces the vulnerability of the existing system by installing redundancy and eliminating single points of failure.

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ATTACHMENTS TO THIS REQUEST

- PowerPoint Presentation.

PREVIOUS COMMISSION ACTIONS OR BRIEFINGS

- June 28, 2007 - Commission authorized design, advertisement, award, and construction of the C4 UPS system for \$2,336,000.