

**PORT OF SEATTLE**  
**MEMORANDUM**

**COMMISSION AGENDA**

**Item No.** 5c

**ACTION ITEM**

**Date of Meeting** February 5, 2013

**DATE:** January 25, 2013

**TO:** Tay Yoshitani, Chief Executive Officer

**FROM:** David Soike, Director, Aviation Facilities and Capital Program  
Wayne Grotheer, Director, Aviation Project Management Group

**SUBJECT:** Airport-wide HVAC Controls Upgrade (CIP # C800497)

**Amount of This Request:** \$274,000      **Source of Funds:** Airport Development Fund

**Est. State and Local Taxes:** \$148,000      **Est. Jobs Created:** N/A

**Est. Total Project Cost:** \$2,157,000

**ACTION REQUESTED:**

Request Commission authorization for the Chief Executive Officer to proceed with the Airport-wide Heating Ventilation & Air Conditioning (HVAC) Controls Upgrade project, and direct staff to prepare design documents. The total amount of this request is \$274,000 and the total projected cost is \$2,157,000.

**SYNOPSIS:**

Commission authorization is requested to proceed with design of the Airport-wide HVAC Controls System. The existing system controls and/or monitors a very large and spread out system that serves the Airport terminal campus. The controls system includes the heating and cooling, water pumping and distribution, ventilation, cooling towers, central plant, smoke control, natural gas and water metering, and waste pumping demands of the Airport.

The current system suffers from significant performance issues due to obsolescence and the mix of network types and the overall number of aging devices on the serial communications network. The existing Airport-wide HVAC Controls System network will be upgraded to a modern ethernet based communications network that can provide sufficient bandwidth and speed to allow operations and maintenance personnel to better manage the Airport-wide systems.

The control systems in the building facilities located at the South Logistic Center (SLC) are not currently connected to the Airport-wide HVAC Control System. The existing serial network does not allow for the addition of a stand-alone system such as the one controlling the SLC. The new system will add a wireless connection to enable addition of existing facilities such as the South Logistic Center (SLC), and it will allow the addition of stand-alone systems with separate servers. This will include future projects in the North and South Satellite Concourses.

## **COMMISSION AGENDA**

Tay Yoshitani, Chief Executive Officer

January 25, 2013

Page 2 of 6

The existing system components and software are a Siemens proprietary system. An existing Competition Waiver is in place that covers the Siemens system. The project specifications will include the proprietary system and be included in the bid package.

The design will be developed using the Mechanical-Electrical Indefinite Delivery/Indefinite Quantity Service Agreement, which has an ordering period end date of April 26, 2014.

This project was included in the 2013 – 2017 capital budget and plan of finance.

### **BACKGROUND:**

The existing Airport-wide mechanical system control network has been evolving over the years and has been modified as larger mechanical system projects have been executed. The current network consists of a mix of serial and ethernet communications that connect the servers to the mechanical systems' field controllers. As a result, the current system suffers from significant performance issues due to the mix of network types, obsolescence of some components, and the overall number of devices on the serial communications network.

The existing system currently runs on a local area network which limits the flexibility in adding stand-alone systems to the airport wide network. The system will be upgraded to an ethernet based wide area network (WAN). The WAN allows the Airport to add separate stand-alone systems such as the SLC control system or future systems that may be required, e.g. at the North and South Satellites.

In addition to the mix of systems, there are two components of the mechanical control network that slow down processing of important data. The first component is the existing system copper "backbone" in Concourse A. This existing copper "backbone" transmits data slowly, creating a bottleneck. The new ethernet system will replace the copper system to provide a "backbone" that can transmit at 100 times faster than copper. The second component is the network hardware and switches. These also need to be replaced to increase data transmission.

The current server and a large portion of the network hardware are at the end of their useful/supportable life (5-7 years). Technical support is no longer available for the existing system hardware and software. The server and hardware must be replaced.

A good faith survey will be completed. Port Construction Services (PCS) will manage the survey. The areas in question are located in Concourse A, we don't anticipate the need for regulated materials abatement; however, a good faith survey is required.

### **PROJECT JUSTIFICATION:**

This request will authorize design services to replace the existing Airport-wide HVAC Control System with an up-to-date data delivery system that includes a new Ethernet fiber optics "backbone," up to date hardware, new server, and updated software. The new system will provide the needed speed and flexibility for current and future needs as well as facilitating the addition of stand-alone systems such as the existing facilities in the SLC.

## **COMMISSION AGENDA**

Tay Yoshitani, Chief Executive Officer

January 25, 2013

Page 3 of 6

### ***Project Objectives:***

- Minimize system downtime and associated operational disruption to tenants.
- Ethernet network expansion to include Concourse A mechanical systems. The upgrade will include major communications links over fiber optic cables. Existing 100 megabit/sec network switches will be replaced with 1 gigabit/sec network switches.
- Upgrade existing Concourse A mechanical systems field panels from serial to ethernet communications.
- Update the current system network hardware major infrastructure.
- Update system infrastructure hardware (servers and workstations) to replace old unsupported equipment.
- Replace existing server infrastructure in boiler control room, provide new racks and environmentally conditioned space for new system server and communications hardware.
- Update system visualization, data collection, and aging software to the latest version and update respective support agreements as required.
- Create a new network connection to the SLC in order to incorporate the building's mechanical equipment into the existing control and monitoring software.
- Integrate cooling tower chemical feed pumps into existing mechanical systems control and monitoring software.
- Update or create mechanical system documentation to reflect system changes including network record drawings.
- Complete project on time and within budget.

### **PROJECT SCOPE OF WORK AND SCHEDULE:**

#### ***Scope of Work:***

The Scope of Work includes the following elements:

- Field Investigation to support design.
- Provide Good Faith regulated materials survey - design for asbestos removal
- Provide design of the Airport-wide HVAC Control Upgrade:
  - Replace the existing copper “backbone” with fiber optics.
  - Replace the existing hardware, server, and software.
  - Add a wireless connection to the SLC.

#### ***Schedule:***

- |   |               |
|---|---------------|
| • Commission Design Authorization       | February 2013 |
| • Commission Construction Authorization | October 2013  |
| • Issue Notice to Proceed               | December 2013 |
| • Construction Substantial Completion   | June 2014     |

## **COMMISSION AGENDA**

Tay Yoshitani, Chief Executive Officer

January 25, 2013

Page 4 of 6

### **FINANCIAL IMPLICATIONS:**

<b><i>Budget/Authorization Summary:</i></b>	<b>Capital</b>	<b>Expense</b>	<b>Total Project</b>
Original Budget	\$1,800,000	\$0	\$1,800,000
Budget Increase	\$357,000	\$0	\$357,000
Revised Budget	\$2,157,000	\$0	\$2,157,000
Previous Authorizations	\$0	\$0	\$0
Current request for authorization	\$274,000	\$0	\$274,000
Total Authorizations, including this request	\$274,000	\$0	\$274,000
Remaining budget to be authorized	\$1,883,000	\$0	\$1,883,000
Total Estimated Project Cost	\$2,157,000	\$0	\$2,157,000

<b><i>Project Cost Breakdown:</i></b>	<b>This Request</b>	<b>Total Project</b>
Construction	\$0	\$1,560,000
Construction Management	\$0	\$86,000
Design	\$125,000	\$125,000
Project Management	\$130,000	\$219,000
Permitting	\$19,000	\$19,000
State & Local Taxes (estimated)	\$0	\$148,000
Total	\$274,000	\$2,157,000

### ***Budget Status and Source of Funds:***

This project, CIP #C800497, was included in the 2013 – 2017 capital budget and plan of finance with a budget of \$1,800,000. The original budget was developed based on a range of magnitude and since has increased due escalation, soft cost recalculation, and addition of scope such as the addition of the wireless connection to SLC. The budget increase will be transferred from the Aeronautical Allowance, CIP C800404, resulting in no net change to the Aviation Division's capital budget. The source of funds is the Airport Development Fund.

### ***Financial Analysis and Summary:***

<b>CIP Category</b>	Renewal/Enhancement
<b>Project Type</b>	Airport Infrastructure
<b>Risk adjusted discount rate</b>	N/A
<b>Key risk factors</b>	N/A
<b>Project cost for analysis</b>	\$2,157,000
<b>Business Unit (BU)</b>	Terminal
<b>Effect on business performance</b>	NOI after depreciation will increase
<b>IRR/NPV</b>	N/A
<b>CPE Impact</b>	\$0.01 increase in 2015

### ***Lifecycle Cost and Savings:***

The project replaces existing electrical and communication infrastructure. By itself, this project does not provide energy efficiency; rather the project provides better monitoring data in real

## **COMMISSION AGENDA**

Tay Yoshitani, Chief Executive Officer

January 25, 2013

Page 5 of 6

time, which allows the maintenance staff to diagnose operational problems quicker and therefore to remedy them quicker. Operational costs will remain the same and are factored into existing Aviation Maintenance budgets.

### **STRATEGIC OBJECTIVES:**

This project will support our Century Agenda Strategic Objective to meet the region's air transportation needs at the Airport for the next 25 years by ensuring that the infrastructure is operationally reliable and well controlled.

### **ENVIRONMENTAL SUSTAINABILITY:**

This project demonstrates environmental sustainability by improving existing Port assets and better utilizing existing resources. This project will replace existing equipment with new more efficient systems. A large portion of the existing materials will be recycled.

### **BUSINESS PLAN OBJECTIVES:**

The project will provide a stable, reliable infrastructure that supports the Aviation Division's strategic goal of operating a world-class international Airport by anticipating and meeting the growing needs of our tenants, passengers, and the region's economy.

### **TRIPLE BOTTOM LINE SUMMARY:**

This project supports:

- The Airport customers by improving response time to mechanical problems which might otherwise impact travelers comfort (air temperature, water temperature, etc.). Operational efficiency can be improved with better control and monitoring data mined from the various mechanical systems at the Airport.
- The environment by recycling a portion of the materials to be removed and by installing new more efficient HVAC Control System equipment.
- The community by ensuring that the Airport is effective and efficient and therefore can remain a financially healthy neighbor and good steward of energy among local cities.

### **ALTERNATIVES CONSIDERED AND THEIR IMPLICATIONS:**

**Alternative 1** – Leave the equipment in place and live with the slow response time, lack of real time data. This alternative represents growing risk to the Port. If an aging component of the system fails, then the remote monitoring and controlling function fails. HVAC systems would still operate at the local thermostats and controllers using either the manufacturers or recent set points. Equipment malfunctions would not be visible to maintenance staff until customers call in with problems such as being too hot or cold. This is not the recommended Alternative.

**Alternative 2** – Replace the existing HVAC Control System with an up to date data delivery system that includes a new fiber optics “backbone,” up-to-date hardware, new server, and updated software. The new system will provide the needed speed and flexibility for current and future needs as well as facilitate the addition of stand-alone systems such as the facilities in the SLC. **This is the recommended alternative.**

**COMMISSION AGENDA**

Tay Yoshitani, Chief Executive Officer

January 25, 2013

Page 6 of 6

**OTHER DOCUMENTS ASSOCIATED WITH THIS REQUEST:**

- N/A

**PREVIOUS COMMISSION ACTIONS OR BRIEFINGS:**

- N/A