



**COMMISSION  
AGENDA MEMORANDUM**

**Item No.** 8c

**ACTION ITEM**

**Date of Meeting** May 23, 2023

**DATE:** May 11, 2023

**TO:** Stephen P. Metruck, Executive Director

**FROM:** Keri Stephens, Director, Aviation Facilities and Capital Programs  
Eileen Francisco, Director, Aviation Project Management

**SUBJECT: Boiler Room Upgrades (CIP# 801230) – Design Authorization**

**Amount of this request:** \$1,479,000

**Total estimated project cost:** \$4,839,000

**ACTION REQUESTED**

Request Commission authorization for the Executive Director to (1) prepare design and construction bid documents for the Boiler Room Upgrades project; (2) utilize Port of Seattle crews to support design and pre-construction activities. The amount of this request is \$1,479,000 for an estimated total project cost not to exceed \$4,839,000.

**EXECUTIVE SUMMARY**

The central mechanical plant provides airport-wide steam and chilled water for cooling, heating, and hot water purposes. This project will update components of the Boiler system to allow for the continued operational ability to utilize both natural gas and diesel fuels, effectively maintaining a layer of redundancy to the system in the event of a natural gas curtailment. This project will install new and replace old steam supply and fuel flow meters, which will improve energy use tracking and accuracy, leading to efficiency savings. This project will also upgrade the control systems for Boilers #1 through #4 to include Siemens DDC integration. The Deaerator and Condensate System Upgrade project, which was previously submitted to Commission, also performs work on the Central Mechanical Plant's heating system. However, that project focuses on different components and will have an extended duration due to the space constraint challenges present in the Central Mechanical Plant.

**JUSTIFICATION**

The central mechanical plant, which houses the boiler and chiller systems, provides the steam and chilled water necessary for providing cooling, heating, and hot water to the main terminal, concourses, and North and South satellites. It is an essential element of the airport, and it is

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critical that it operates in a consistent and efficient manner. Natural gas curtailment events, which occurred as recently as Q1 2023, have illustrated the necessity for a resilient and redundant system. This project will replace aging components of the boiler system to ensure continued reliability during curtailment events, as well as to increase its overall energy efficiency. Additionally, the boiler system controls will be updated for better connectivity to the central mechanical plant control room.

***Diversity in Contracting***

The design services will be completed using an existing IDIQ contract that was established in 2022 which has a 16% WMBE participation utilization requirement.

**DETAILS**

***Scope of Work***

This project will modify Boiler #4 improving the ability to utilize both natural gas and diesel fuels, as well as to resolve fuel and steam metering issues on all four boilers. Additionally, the control systems for boilers #1 through #4 will be upgraded to include Siemens DDC integration with BacNet Protocol.

- (1) Boiler #4 modified to improve dual fuel operations.
- (2) Install new and replace old steam supply, natural gas, and diesel fuel flow meters on Boilers #1 through #4.
- (3) Install new Exhaust Gas Analyzer for Boiler #4.
- (4) Upgrade control systems on Boilers #1 through #4 to include Building Automation System and Siemens DDC.
- (5) Design modification for a permanent compressed air supply for long term operation and startup under emergency conditions.
- (6) Install additional emergency shut down buttons for boiler system where absent at operator station and corridor exits to increase operational safety.

***Schedule***

*Activity*

Design complete	Q3 2024
Commission construction authorization	Q4 2024
Construction Notice to Proceed	Q1 2025
Substantial completion	Q1 2026

***Cost Breakdown***

	This Request	Total Project
Design	\$1,479,000	\$1,479,000
Construction	\$0	\$3,360,000
Total	\$1,479,000	\$4,839,000

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**ALTERNATIVES AND IMPLICATIONS CONSIDERED**

**Alternative 1** – Status Quo. Do not proceed with the project.

Cost Implications: Approximately \$40,000 for Notebook Development would be expensed.

Pros:

- (1) Defers capital investment.

Cons:

- (1) Natural gas curtailments may occur at any time, but are often associated with colder weather, as evidenced by a recent curtailment event in Q1 2023. Without a reliable redundancy system, the airport steam needs may not be able to be met in the case of a major gas curtailment event.
- (2) Potential for additional increase in costs for materials, labor, and inflation.

This is not the recommended alternative.

**Alternative 2** – Proceed with project as scoped. Install equipment needed to allow for continued operational ability on both natural gas and diesel fuel.

Cost Implications: \$4,839,000 in capital costs.

Pros:

- (1) Maintains a layer of redundancy in the event of a gas curtailment. Airport steam needs can be met while on diesel fuel, even at peak demand.
- (2) New fuel flow meters allow for more accurate energy use tracking, leading to greater efficiency and cost savings.
- (3) Updated control panels allow for DDC integration.
- (4) Install additional emergency shut off buttons.

Cons:

- (1) Capital costs.

***This is the recommended alternative.***

**FINANCIAL IMPLICATIONS**

***Cost Estimate/Authorization Summary***

Capital

Expense

Total

	Capital	Expense	Total
<b>COST ESTIMATE</b>			
Original estimate	\$3,406,000	\$0	\$3,406,000
Current change	\$1,433,000	\$0	\$1,433,000
Revised estimate	\$4,839,000	\$0	\$4,839,000
<b>AUTHORIZATION</b>			
Previous authorizations	\$40,000	\$0	\$40,000
Current request for authorization	\$1,479,000	\$0	\$1,479,000

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Total authorizations, including this request	\$1,519,000	\$0	\$1,519,000
Remaining amount to be authorized	\$3,320,000	\$0	\$3,320,000

***Annual Budget Status and Source of Funds***

The Boiler Room Upgrade (CIP# 801230) is included in the 2023-2027 capital budget and plan of finance with a budget of \$3,406,000. The capital budget increase of \$1,433,000 was transferred from the Aeronautical Allowance CIP C800753 resulting in no net change to the Airport capital budget. The funding sources will be the Airport Development Fund and existing revenue bonds.

***Financial Analysis and Summary***

Project cost for analysis	\$4,839,000
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	\$0.01 in 2027

***Future Revenues and Expenses (Total cost of ownership)***

This project will likely have no impact on Aviation Maintenance operating & maintenance (O&M) costs.

**ATTACHMENTS TO THIS REQUEST**

- (1) Presentation slides

**PREVIOUS COMMISSION ACTIONS OR BRIEFINGS**

N/A