



**COMMISSION
AGENDA MEMORANDUM**

Item No. 8b

ACTION ITEM

Date of Meeting April 18, 2023

DATE: April 6, 2023

TO: Stephen P. Metruck, Executive Director

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

**SUBJECT: Deaerator (DA) and Condensate System Upgrades (CIP# C801223) –
Design and Construction Authorization**

Amount of this request: \$3,500,000

Total estimated project cost: \$14,656,000

ACTION REQUESTED

Request Commission authorization for the Executive Director to (1) increase the project budget by \$4,639,000, for a revised total budget of \$14,656,000; (2) execute a professional services contract for design services; (3) Prepare design and construction bid documents for the Deaerator and Condensate System upgrade project; (4) Advertise and execute a major works construction contract for the installation of the secondary air compressor portion of this project; (5) utilize Port crews for pre-construction activities and abatement. The amount of this request is \$3,500,000 for an estimated total project cost not to exceed \$14,656,000.

EXECUTIVE SUMMARY

The Central Mechanical Plant (CMP) uses a campus steam and condensate return system to provide domestic heating and hot water for the Sea-Tac Airport. The original plant, along with the Deaerator (DA) and condensate systems, was constructed in 1969-1970. This project will replace the DA and condensate tanks and associated equipment to continue to provide domestic hot water and heat to the terminal. Additionally, a second air compressor system in mechanical room 211 will be installed to serve CMP pneumatic systems required for CMP operation.

Since the preliminary budget was developed three years ago, it has become necessary to add scope (needed for continuous operations) related to the CMP pneumatic systems and services. In addition, rising material costs, increased labor rates, and increased abatement scope has resulted in \$4.6 million in additional costs.

Meeting Date: April 18, 2023

JUSTIFICATION

These DA and condensate systems including the tanks, associated piping, and pumping are at their end of life and suspected to be near failure due to age and use. Failure of these systems would render the Airport unable to use the boiler system as designed until they are replaced. This would result in a lack of hot water for the airport, meaning restaurants and lounges would no longer be able to operate.

This project will have a potential net energy use reduction. Installing more energy efficient pumps, variable frequency drives (VFDs), and upgrading the 50-year-old systems should improve the CMP's overall efficiency.

Diversity in Contracting

Part of the design services will be completed using an existing IDIQ contract that was established in 2022 which has a 17% WMBE participation utilization requirement. WMBE goals will be evaluated for the remaining project specific design services.

DETAILS***Scope of Work***

Key elements of this project include:

- (1) Add a second air compressor to mechanical room 211 to serve as a backup when the three Joy air compressors are removed from the CMP.
- (2) New backup air compressor to be supplied with emergency power.
- (3) Remove and dispose of the Boiler Room air handling unit to allow access to the DA and condensate tanks and piping.
- (4) Remove and dispose of the three Joy air compressors and the associated air dryers and receivers, to allow access to the DA and condensate tanks and piping.
- (5) Remove and replace the DA (1 tank) and Condensate (1 tank) tanks and piping as required to support the three 30,000 lbs./hour steam boilers and one 40,000 lbs./hour steam boiler.
- (6) Remove and replace the blowdown and flash tank capable of supporting the three 30,000 lbs./hour steam boilers and one 40,000 lbs./hour steam boiler.
- (7) Remove and replace the feedwater pumps and piping and condensate pumps (6 pumps total).
- (8) Install three new VFD's and install feedwater controls as required to the three feedwater pumps.
- (9) Install VFD's for the three condensate pumps to improve efficiency.
- (10) Relocate (permanently or temporarily) two Siemens DDC Panels (HCP Nodes 10 and 11) located in the project area. The panels were replaced in 2016 and do not need replacement but they are a physical obstacle. The panels control / interface with the boiler operating equipment and will need to be evaluated during design for phasing impacts depending on whether new systems are installed in parallel.

Meeting Date: April 18, 2023

- (11) Add level control loop to adjust condensate pump(s) VFD speed.
- (12) A temporary system will be required during construction to provide the needed domestic hot water for ADR and tenants.
- (13) Structural upgrades will be required, per new building codes, for the existing elevated platform that the tanks are mounted on.
- (14) Remove and replace the make-up feedwater and water softener.
- (15) This project will require abatement (tanks and associated piping are presumed to be wrapped in asbestos insulation).

Schedule

Commission Design & Construction Authorization – Secondary Air Compressor	2023 Quarter 2
Commission Design Authorization – DA & Condensate	2023 Quarter 2
Commission Construction Authorization– DA & Condensate	2025 Quarter 3
Construction Start – Air Compressor	2024 Quarter 4
Construction Start – DA & Condensate Tanks	2025 Quarter 4
In-Use Date Air Compressor	2025 Quarter 4
In-Use Date – DA & Condensate	2028 Quarter 1

Cost Breakdown

	This Request	Total Project
Design	\$2,750,000	\$3,500,000
Construction	\$750,000	\$10,000,000
Total	\$3,500,000	\$14,656,000

ALTERNATIVES AND IMPLICATIONS CONSIDERED

Alternative 1 – Defer project to a later date or cancel project.

Cost Implications: Expense approximately \$40,000 for notebook development costs.

Pros:

- (1) Defer major capital investment costs.

Cons:

- (1) System failure could occur at any time resulting in large expense costs for emergency repairs and shutdowns to restaurants, lounges, and other tenant owned spaces.
- (2) Potential for additional increase in costs for materials, labor, and/or inflation.

This is not the recommended alternative.

Alternative 2 – Remove secondary air compressor from this project and replace at a later date with a separate project.

Meeting Date: April 18, 2023

Cost Implications: Capital project investment of an estimated \$13.6M for planning, design, and construction.

Pros:

- (1) Shorten overall project schedule.
- (2) Defer estimated \$1,000,000 for the design and construction of the secondary air compressor.

Cons:

- (1) Single point of failure for the CMP. Proper air compressor operation is critical to CMP function. Failure of the Air system will be catastrophic to the CMP, and Airport Operations.
- (2) Potential for additional increase in costs for materials, labor, and/or inflation if this portion of the project is deferred to a later date.

This is not the recommended alternative.

Alternative 3 – Remove and replace the Deaerator (DA) and Condensate tanks in the Central Mechanical Plant and add a secondary air compressor in Mechanical Room 211.

Cost Implications: Capital project investment of an estimated \$14.6M for planning, design, and construction.

Pros:

- (1) Mitigate potential for failures that negatively affect the operation of the boiler system.
- (2) Improved efficiency over existing systems.
- (3) Increase reliability and decrease maintenance costs.

Cons:

- (1) Large capital project investment.

This is the recommended alternative.

Cost Estimate/Authorization Summary

	Capital	Expense	Total
COST ESTIMATE			
Original estimate	\$9,805,000	\$0	\$9,805,000
Current change	\$4,639,000	\$212,000	\$4,851,000
Revised estimate	\$14,444,000	\$212,000	\$14,656,000
AUTHORIZATION			
Previous authorizations	\$100,000	\$0	\$100,000
Current request for authorization	\$3,500,000	\$0	\$3,500,000

Meeting Date: April 18, 2023

Total authorizations, including this request	\$3,600,000	\$0	\$3,600,000
Remaining amount to be authorized	\$10,844,000	\$212,000	\$11,056,000

Annual Budget Status and Source of Funds

This project, C801223, is included in the 2023-2027 capital budget and plan of finance with a budget of \$9,805,000. The capital budget increase of \$4,639,000 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 future revenue bonds. This project was presented to the airlines at an Airport Airlines Affairs Committee and the Majority in Interest (MII) ballot will be approved on April 10, 2023.

Financial Analysis and Summary

Project cost for analysis	\$14,656,000
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	\$0.04 in 2028

Future Revenues and Expenses (Total cost of ownership)

As a result of this project, Aviation Maintenance may see a small increase in preventative maintenance support.

ATTACHMENTS TO THIS REQUEST

- (1) Presentation

PREVIOUS COMMISSION ACTIONS OR BRIEFINGS

None