COMMISSION
AGENDA MEMORANDUM **Item No.** 8e

ACTION ITEM **Date of Meeting** July 23, 2024

DATE: July 12, 2024

TO: Stephen P. Metruck, Executive Director

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

SUBJECT: 400Hz Replacement C-D (CIP# 801225) – Design & Construction Authorization

Amount of this request:	$27,287,000
Total estimated project cost:	$27,487,000

ACTION REQUESTED

Request Commission authorization for the Executive Director to 1) prepare, advertise, and execute a Public Works Building Engineering Systems Contract; 2) Execute related project change orders, amendments, work authorizations, purchases, contracts, and take other actions necessary to support and deliver the 400Hz replacement project within the approved budget 3) Use of Port of Seattle crews to support design and construction activities. The amount of this request is $27,287,000 for an estimated total project cost not to exceed $27,487,000.

EXECUTIVE SUMMARY

This project will replace a total of four (4) 400Hz rotary motor-generators that are nearing end of life. A set of two (2) generators are located on Concourse C and another set of two (2) are located on Concourse D. The 400Hz systems provide ground power more efficiently to aircraft when parked at the terminal during ground operations. This system removes the need for aircraft to continuously run their engines, which conserves fuel, eliminates exhaust emissions, and reduces noise on the airfield. This project will also replace up to seven (7) 400Hz gateboxes that are nearing end of life at specific gates on Concourses D and C.

JUSTIFICATION

Seattle-Tacoma International Airport (SEA) strives to be among the most environmentally friendly airports in the United States by committing to responsible and efficient energy solutions. Part of the airport's energy commitment relies on reliable, well-operating 400Hz power infrastructure, which powers serviced aircraft and allows for full engine shutdown, resulting in

reduced emissions, fuel consumption, and noise. In cooperation with other environmentally friendly systems utilized by SEA, the use of 400Hz power saves our airline partners, passengers, and surrounding communities approximately 5 million gallons of fossil fuel use, $15 million in fuel expenditures, 73 tons of nitrogen oxide (NOx) emissions, and 40,000 metric tons of greenhouse gases yearly.

With an expected service life of approximately 20 to 25 years, replacing 400Hz equipment at the appropriate time is important to maintaining smooth airport operations and upholding the Airport's commitment to efficient energy. The work for this project will replace existing assets that are highly utilized by our airline partners. Disruption to the 400Hz power systems have direct impact to airport operations.

Diversity in Contracting

The design and construction services for this project will be completed by a project specific Building Engineering Systems contractor. A WMBE availability analysis has been submitted and 12% WMBE participation is anticipated for this project.

DETAILS

Scope of Work

Replace a total of four (4) 400Hz rotary motor-generators and seven (7) 400Hz gateboxes that are nearing end of life.

(1) Concourse C
- Two 400Hz rotary motor-generators
- Install three new gate boxes where existing gate boxes nearing end of life.
    - Gate Boxes C3, C9, and C17

(2) Concourse D
- Two 400Hz rotary motor-generators
- Install four new gate boxes where existing gate boxes nearing end of life.
    - Gate Boxes D1, D2, D7, and D11

(3) Regulated Materials Management (RMM) – Coordination and containment.
(4) Disconnect and reinstall existing equipment if necessary or required, which includes Gate D1 Passenger Loading Bridge (PLB) and PC Air Unit.
(5) Modify or install generator foundation pads, if applicable.

Schedule

Activity

Advertise RFQ for BES Contractor	Q1 2025
Contract Execution for BES Contractor	Q1 2026
Notice to Proceed - Design	Q1 2026
Design Complete	Q4 2026
Notice to Proceed - Construction	Q4 2026

Substantial Completion	Q4 2027

Cost Breakdown	This Request	Total Project
Design	$5,525,000	$5,725,000
Construction	$21,526,000	$21,526,000
Total	$27,287,000	$27,487,000

ALTERNATIVES AND IMPLICATIONS CONSIDERED

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

Cost Implications: Approximately $200,000 for Notebook Development would be expensed.

Pros:

(1) Defers capital investment.

Cons:

(1) Significant risk of unplanned 400Hz power outages on Concourse C and Concourse D due to aging equipment.
(2) Risk of equipment failure and emergency 400Hz generator and/or gatebox replacement, resulting in increased time and cost.
(3) A future project would be required to address the aging equipment, likely resulting in additional cost increases (material, labor, and inflation).

This is not the recommended alternative.

Alternative 2 – Reduced Scope – C Concourse Only – 2 Generators and 3 Gateboxes.

Cost Implications: $16,500,000 total project cost

Pros:

(1) Maintains original Status 2 budget.
(2) Eliminates gate outage conflict on Concourse D.
(3) Addresses the more critical generators that have illustrated increased maintenance issues (C concourse generators are 5 years older than D Concourse generators).
(4) Potential to accelerate project schedule in design and construction phases.

Cons:

(1) Risk of unplanned outage or emergency replacement of D Concourse generators remains.
(2) Follow-up project will be needed to replace D Concourse generators if this alternative is chosen.

This is not the recommended alternative.

Alternative 3 – Full Scope – 4 Generators and 7 Gateboxes

Cost Implications: $27,487,000 total project cost

Pros:

(1) Replaces all 4 aging 400Hz Generators and 7 Gate Boxes that are nearing end of functional lifespan.
(2) Reduces the risk for unplanned failures and outages, which result in increased maintenance costs.
(3) Significantly reduces the potential for an emergency generator replacement, which would result in an overall increase in cost and outage schedule.
(4) Simultaneous replacement of critical electrical equipment helps maintain long-term phasing and outage planning at the airport, which helps in the assessment of future proofing opportunities.

Cons:

(1) Additional $10,987,000 capital cost over Status 2 budget.
(2) Requires significant gate outage time for Gate D1 (up to 10 months).
(3) Removal of Gate D1 PLB for generator access.

This is the recommended alternative.

FINANCIAL IMPLICATIONS

Cost Estimate/Authorization Summary	Capital	Expense	Total
COST ESTIMATE			
Original estimate	$16,500,000	$0	$16,500,000
Current change	$10,751,000	$236,000	$10,987,000
Revised estimate	$27,251,000	$236,000	$27,487,000
AUTHORIZATION			
Previous authorizations	$200,000	$0	$200,000
Current request for authorization	$27,051,000	$236,000	$27,287,000
Total authorizations, including this request	$27,251,000	$236,000	$27,487,000
Remaining amount to be authorized	$0	$0	$0

The change in cost from the original Status 2 estimate in 2020 is due to (1) a significant increase in material and labor costs; (2) clarification on complex phasing and methodology required for the replacement of the D Concourse generators; and (3) better accuracy of scope, activity costs, lead time, and scheduling based on lessons learned from previous projects utilizing electrical equipment and/or Building Engineering Systems for project delivery.

Annual Budget Status and Source of Funds

This project (CIP #C801225) was included in the 2024-2028 Capital Budget and plan of finance with a total capital budget of $16,500,000. The capital increase of $10,751,000 was transferred

from the Aeronautical Allowance[1] CIP C800753 resulting in no net change to the Airport capital budget. The funding sources will be the Airport Development Fund (ADF).

Financial Analysis and Summary

Project cost for analysis	$27,251,000
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	$0.07 in 2028

Future Revenues and Expenses (Total cost of ownership)

This project will likely have no impact on Aviation Maintenance operating & maintenance costs.

ATTACHMENTS TO THIS REQUEST

(1) Presentation

PREVIOUS COMMISSION ACTIONS OR BRIEFINGS

None.

[1] The Aeronautical Allowance is included in the Capital Improvement Plan to ensure funding capacity for unspecified projects, cost increases for existing projects, new initiatives, and unforeseen needs. This ensures funding capacity for unanticipated spending within the dollar amount of the Allowance CIP.