

PORT OF SEATTLE
MEMORANDUM

COMMISSION AGENDA
ACTION ITEM

Item No. 6a
Date of Meeting March 18, 2014

DATE: March 10, 2014
TO: Tay Yoshitani, Chief Executive Officer
FROM: Dave Soike, Director, Aviation Facilities and Capital Program
Wayne Grotheer, Director, Aviation Project Management Group
SUBJECT: North Utility Tunnel Steam Piping Upgrade (CIP #C800659)

Amount of This Request:	\$1,250,220	Source of Funds:	Airport Development Fund (ADF)
Est. Total Project Cost:	\$1,250,220		
Est. State and Local Taxes:	\$74,600		

ACTION REQUESTED

Request Commission authorization for the Chief Executive Officer to design, advertise, and execute a major works construction contract for the North Utility Tunnel Steam Piping Upgrade project at Seattle-Tacoma International Airport in the amount of \$1,250,220.

SYNOPSIS

This authorization would allow for design and construction of upgrades to the aging steam heat and hot water delivery system to the Airport's North Satellite. Design and construction are being requested simultaneously to expedite completion of the project during the summer months, when there is no need to heat the North Satellite.

BACKGROUND

The steam pipes that provide heat and hot water to the North Satellite run from the boiler room in through a utility tunnel to the North Satellite. As the temperature of these pipes fluctuates through normal operations, the pipe lengths expand and contract. The expansion joints in these pipes use ball joints that allow the pipe to lengthen and shorten without being damaged. These ball joints have exceeded their life expectancy by 15 years. Many now leak and need to be replaced and are showing signs of failure that could result in heat and hot water outages to the North Satellite that could last several months. Authority for design and contract execution is being requested in one action in order to complete the project during the summer months, when it is not necessary to heat the North Satellite. This project was included in the 2014 – 2018 capital budget.

The existing steam piping expansion joints were installed 45 years ago and have exceeded the manufacturer's recommended useful life by 15 to 20 years. The expansion joint conditions were

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assessed during several site visits and meetings by Aviation Facilities and Infrastructure and Maintenance groups, who determined that the expansion joints leak and should be replaced immediately to prevent possible consequences caused by a major connection failure. Port Maintenance Crews have tightened the flange bolts in an attempt to fix the leaks. Further tightening of the flange bolts is not recommended due to the possibility of causing the flange gasket to fully collapse and disrupt steam service to the North Satellite for an extended period of time.

PROJECT JUSTIFICATION AND DETAILS

Authorization of this request will allow existing expansion joints to be replaced prior to a connection failure. A connection failure could result in the following:

- Expansion joint failure could cause damage to the steam line, leaving the North Satellite without heat or hot water for concessions and restrooms for several months.
- Expansion joint failure is also a safety concern; any personnel located in the vicinity will be exposed to live high pressure steam that is operating at 100 pounds per square inch pressure and has a temperature over 300 degrees Fahrenheit.
- Existing steam leaks are causing energy losses that are estimated to be around \$10,000 annually for a single steam leak through 1/8" orifice at 100 pounds per square inch operating pressure, which adds up to tens of thousands of dollars annually for multiple leaks present at the North Satellite tunnel.

Project Objectives

- Replace existing expansion joints in steam and condensate lines in North Utility Tunnel.
- Complete project on schedule.
- Complete project within budget.
- Reduce risk of piping failure that could cause extended utility outages to North Satellite.
- Reduce safety risk to personnel working in North Utility Tunnel.
- Develop detailed plans for current pipe conditions in tunnel to be used on this project as well as future projects.
- Perform construction prior to winter months to remove cost impact of temporary heating.
- Minimize disruption to North Satellite tenants and operations by installing a temporary boiler to provide hot water to restrooms and concessions.

Scope of Work

- Design for this scope of work will be procured under an existing design services indefinite delivery, indefinite quantity (IDIQ) contract.
- Survey and documentation of steam line to confirm locations of existing steam and condensate lines, supports, anchors, slides, guides, steam traps, ball joints, and appurtenances. Create updated tunnel plans and piping diagrams depicting this updated condition.

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- Perform piping thermal analysis to allow for proper design of expansion joints.
- Engineer evaluation of existing pipe support, anchors, slides, guides, and support bracing. Replace as necessary.
- Replace existing expansion joints on existing steam and condensate lines in five locations in the North Utility Tunnel.
- Perform necessary abatement of existing gaskets and pipe insulation containing asbestos.
- Install temporary propane boiler to provide hot water to North Satellite during construction operations.

Schedule

The project schedule is as follows:

Project Notebook Approval	February 2014
Commission Authorization for Design and Construction	March 2014
Design Start (Under Existing IDIQ)	March 2014
Advertise, Execute	June 2014
Construction	July through mid-October 2014

FINANCIAL IMPLICATIONS

<i>Budget/Authorization Summary</i>	Capital	Expense	Total Project
Original Budget	\$1,000,000	\$0	\$1,000,000
Budget Increase	\$250,200		\$250,200
Revised Budget	\$1,250,200		\$1,250,200
Previous Authorizations	\$0	\$0	\$0
Current request for authorization	\$1,250,200	\$0	\$1,250,200
Total Authorizations, including this request	\$1,250,200	\$0	\$1,250,200
Remaining budget to be authorized	\$0	\$0	\$0
Total Estimated Project Cost	\$1,250,200	\$0	\$1,250,000

<i>Project Cost Breakdown</i>	This Request	Total Project
Construction	\$785,264	\$785,264
Construction Management	\$168,831	\$168,831
Design	\$95,882	\$95,882
Project Management	\$117,790	\$117,790
Permitting	\$7,853	\$7,853
State & Local Taxes (estimated)	\$74,600	\$74,600
Total	\$1,250,200	\$1,250,200

Budget Status and Source of Funds

This project was included in the 2014-2018 capital budget and plan of finance with a budget of \$1,000,000. Upon completion of the project notebook, the budget estimate was refined. The

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budget increase will be transferred from the Aeronautical Allowance CIP (C800404) so that there will be no net change to the Airport capital budget. The funding source will be the Airport Development Fund.

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	\$1,250,220
Business Unit (BU)	Terminal Building
Effect on business performance	NOI after depreciation will increase
IRR/NPV	N/A
CPE Impact	Less than \$.01 in 2015.

Lifecycle Cost and Savings

This project will eliminate the existing steam leaks that are causing energy losses estimated to be around \$10,000 annually for a single steam leak through 1/8" orifice at 100 pounds per square inch operating pressure, which adds up to tens of thousands of dollars annually for multiple leaks present at the North Satellite tunnel.

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.

TRIPLE BOTTOM LINE

Economic Development

This project will allow the Port to continue providing our airline and concessions tenants with uninterrupted heat and hot water to the North Satellite. Completion of this project will prevent an inevitable heat/hot water outage, and also prevent the economic impacts of an emergency repair project and the potential costs to tenants at the North Satellite.

Environmental Responsibility

As stated above, this project will eliminate the existing steam leaks that are causing energy losses estimated to be around \$10,000 annually for a single steam leak through 1/8" orifice at 100 pounds per square inch operating pressure. Eliminating this wasted energy will be a benefit to the environment.

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Community Benefits

The project manager and Central Procurement Office will coordinate with the Office of Social Responsibility to determine opportunities for small business participation in support of Resolution No. 3618.

ALTERNATIVES AND IMPLICATIONS CONSIDERED

Alternative 1) – Do Nothing - This will result in more steam and condensate leaks that will eventually lead to failure. Failure of the line will result in long outages of heat and hot water to restrooms and concessions in the North Satellite. This is not the recommended alternative.

Alternative 2) – Attempt to replace the most vulnerable expansion joints using small works funds. This alternative assumes that we can predict which joints are more likely to fail and requires shutdowns to the line during each replacement without the temporary boiler to provide hot water to the North Satellite during the outage. This is not the recommended alternative.

Alternative 3) – Replace the expansion joints in both the steam pipe and condensate lines. This option allows the upgrade at one time. Temporary propane water heater can be provided during this work to minimize impact on the heating water and domestic water systems. This method is the most economical because it requires only one mobilization. **This is the recommended alternative.**

ATTACHMENTS TO THIS REQUEST

- None

PREVIOUS COMMISSION ACTIONS OR BRIEFINGS

- None