

A photograph of the Spokane St Swing Bridge (Low Bridge) over a river, with a blue overlay. The bridge is a concrete structure with a central tower and cables. A wooden railing is visible in the foreground on the right. The sky is overcast.

Spokane St Swing Bridge (Low Bridge) Emergency Closure

Transportation & Seattle Public Utilities Committee Briefing
January 17, 2022

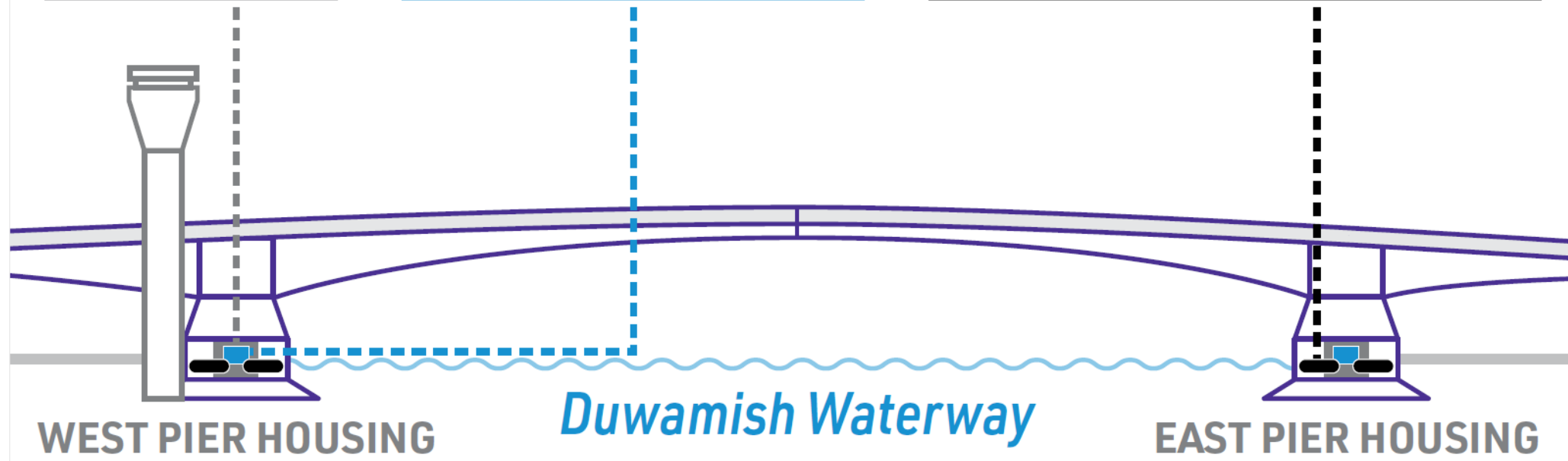
Low Bridge

SPOKANE ST SWING BRIDGE (LOW BRIDGE) – JANUARY 2023

LIFT CYLINDER:
lifts and rotates
the bridge

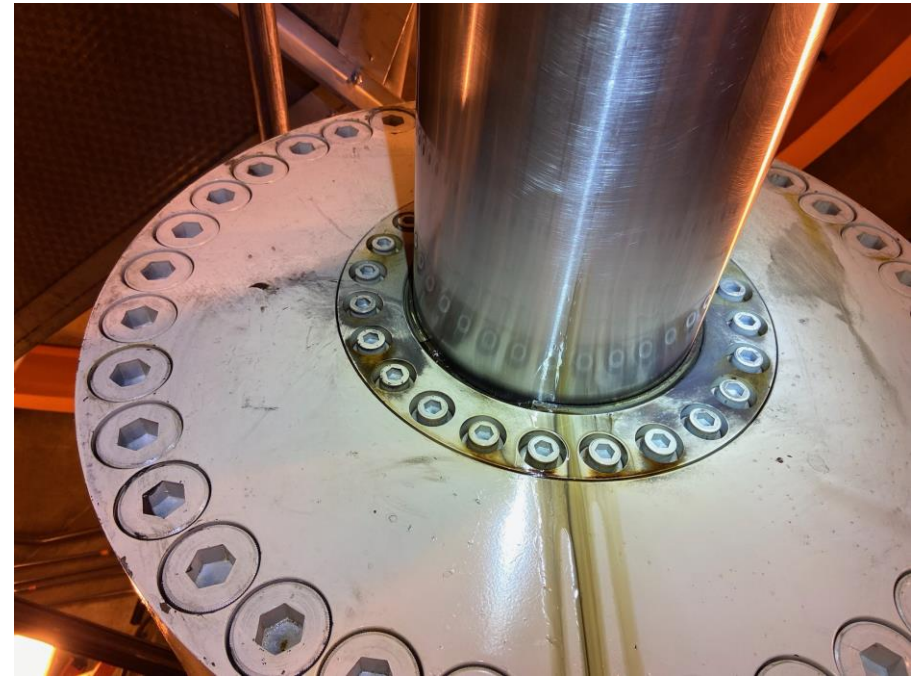
HYDRAULIC PUMPS:
pumps the fluid that lifts
and turns the cylinders

TURN CYLINDERS: push and pull on
the lift cylinder to rotate the bridge
span allowing it to open and close



Diagnosis

- Turn cylinders were scheduled for overhaul in 2023 before shutdown occurred
- Record setting ice storm Dec 23 resulted in a bridge power outage
- After outage, eastern bridge span only moved part way and stalled
- Span took several attempts to fully open
- Found turn cylinder hydraulic fluid leaking at greater rate than before
- Cylinder could not be used without risk of creating a larger problem
- King Tide impacted electrical conduit to the bridge span tail locks



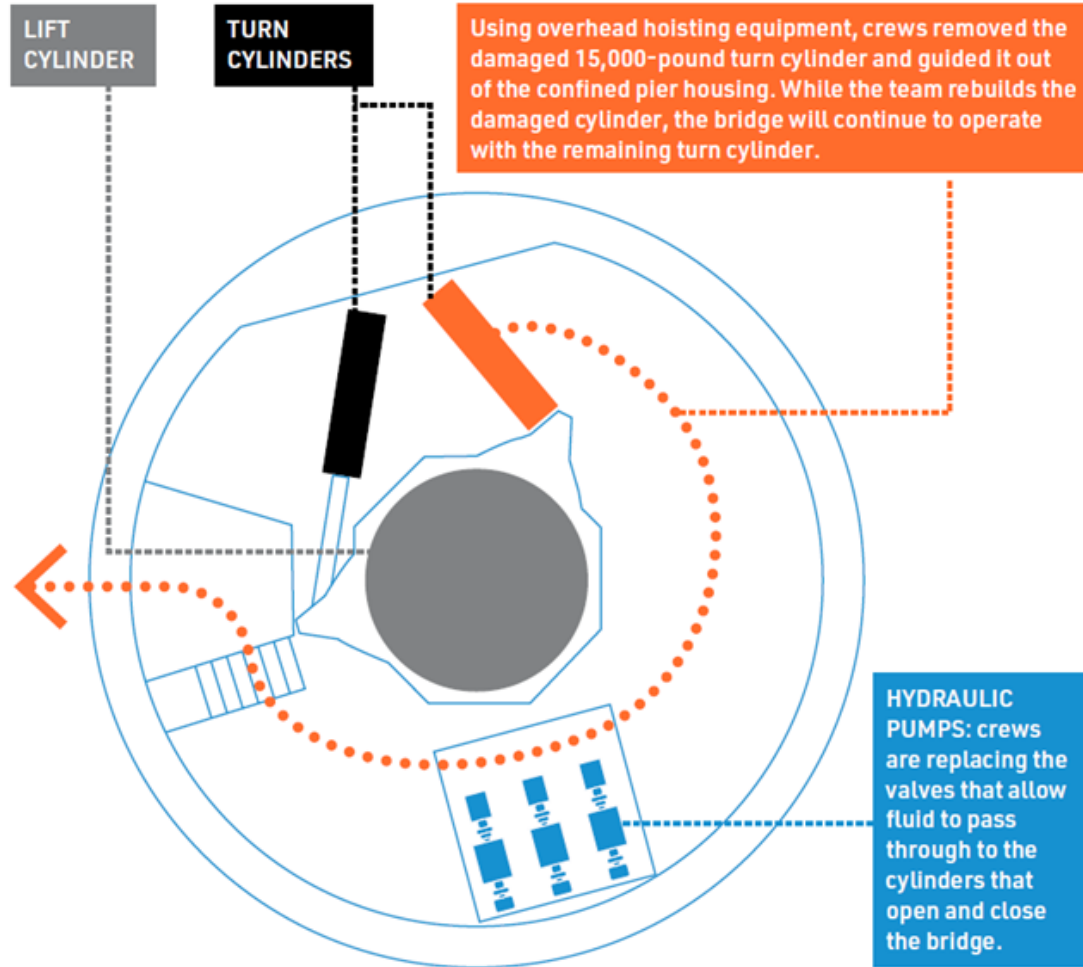
Response and Recovery

- Reopened bridge to traffic on Jan 13
- Removed leaking cylinder on east side for refurbishment on Jan 8
- Reprogrammed east side to operate with remaining cylinder
- Ran test opening cycles Jan 9-10 to confirm single-cylinder operations
- Replaced hydraulic system pumps valves Jan 11; system testing on Jan 12
- Bridge opens and closes more slowly during single-cylinder operations
- Continue removal and single-cylinder operation cycle until 4 cylinders refurbished



Cylinder Removal

SPOKANE ST SWING BRIDGE (LOW BRIDGE) EAST PIER HOUSING TOP VIEW



The cylinder is lowered into a custom-built cradle, and removed from pier house using internal crane rails

Pump Valve Replacement

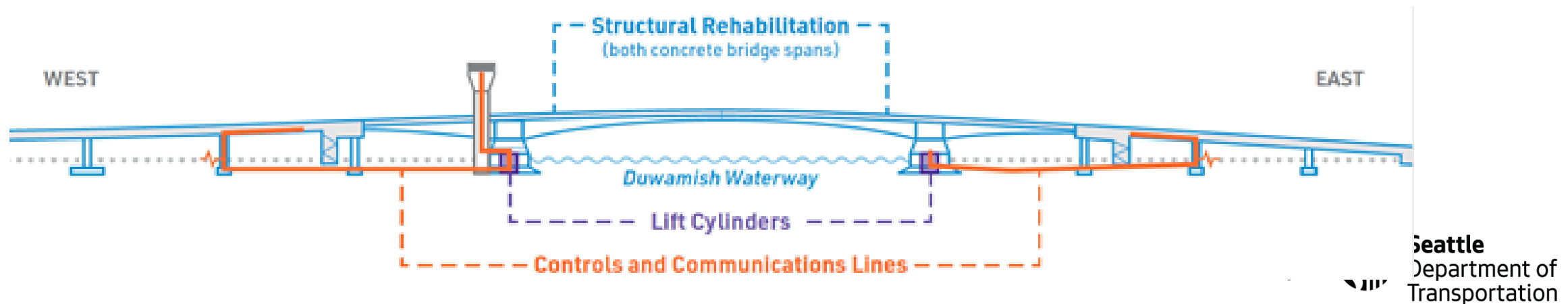
Hydraulic power unit contains the pumps, valves and motors that push the fluid that powers the cylinders

- Opened pumps and replaced failed valves on Jan 11
- Ensures no hydraulic fluid gets into the motors



Accelerates planned work for low bridge

- Strengthen the bridge (completed Oct 2022)
- Replace pump arrays (scheduled Feb 11 - 14)
- Rehabilitate the east side lift cylinder, which does the heavy lifting to open and close the bridge (Spring 2023)
- Upgrade the control and communications system that open and close the bridge (2023)



Bicycle detour

- Installed temporary bike lane on 1st Ave S and W Marginal Way SW on Jan. 4-5; 1st Ave S removed Jan 14
- W Marginal Way SW remains in place while conversations continue about a permanent protected bike lane
- Cones and signs checked three times per day by SDOT
- Bicycle and vehicle counts taken daily on all temporary detour routes



Free transit



- Free rides for pedestrians and people biking on W Seattle buses and water taxi began Jan 6
- Partnership with King County Metro
- Seattle Transit Measure funds
- Rides available using Transit Go rewards app widely promoted by Flip Your Trip/WSB Program in 2022
- Program ended Jan 13 when low bridge reopened

Questions & discussion

