


Seattle City Light Boundary Dam & Sluice Maintenance Gate Retrofit





Pend Oreille River in NW Washington
Double curvature, thin arch dam – 340'

Crest at 2000'
Two Spillgates – 108,000 CFS
Water at Max Plant Output – 55,000 CFS
Plant Output – 1050 MW

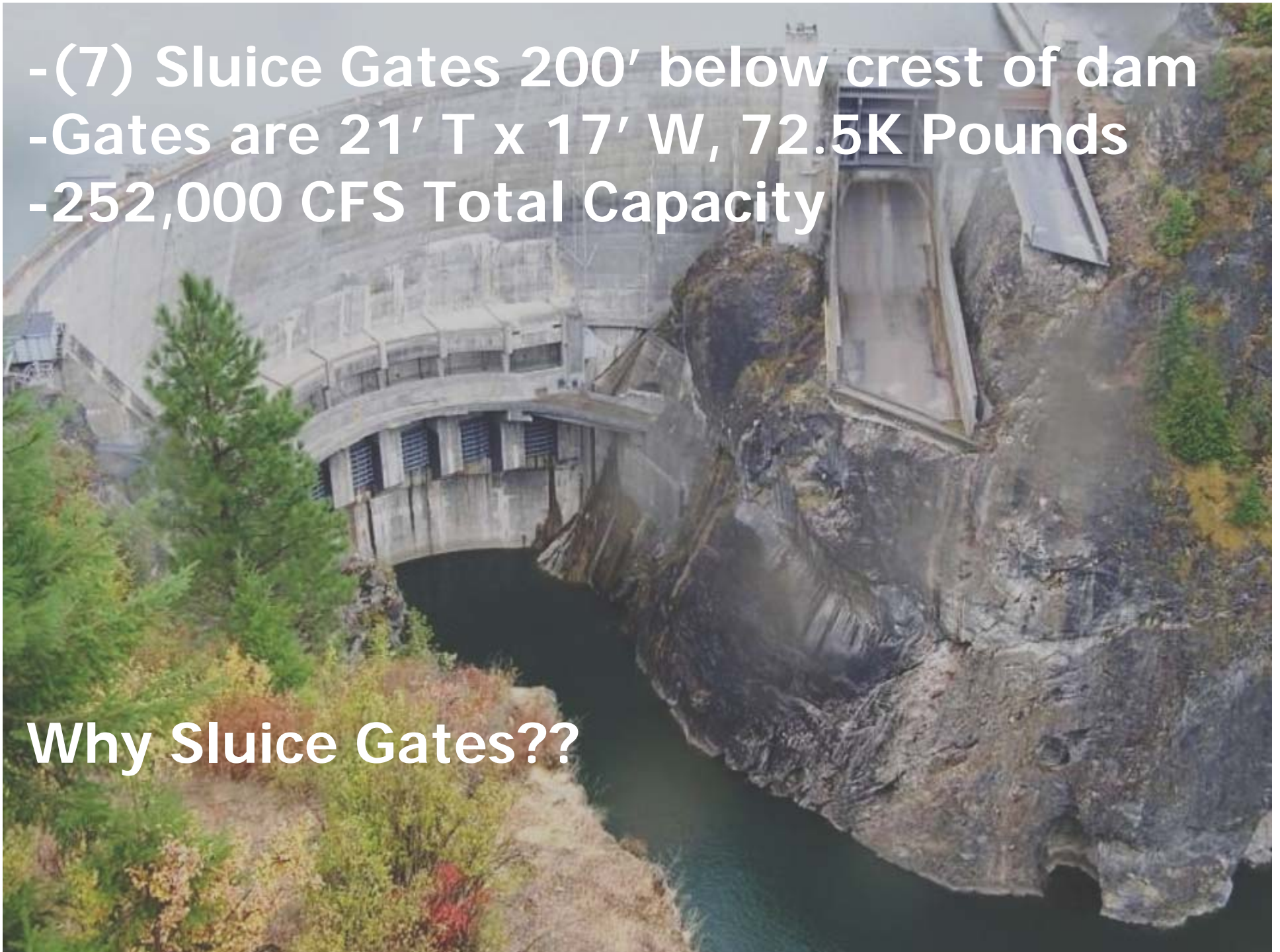
An aerial photograph of a large dam and reservoir. The dam is a curved concrete structure spanning a deep gorge. The water in the reservoir is a deep blue-green color. The surrounding landscape is covered in dense green forest. The powerhouse is located underground, with a large tunnel entrance visible at the base of the dam. To the right of the dam, there are several smaller structures, possibly part of the power plant or water management system.

**Powerhouse is entirely
underground**

**First operated: 1967
2 additional units: 1986**

- (7) Sluice Gates 200' below crest of dam
- Gates are 21' T x 17' W, 72.5K Pounds
- 252,000 CFS Total Capacity

Why Sluice Gates??

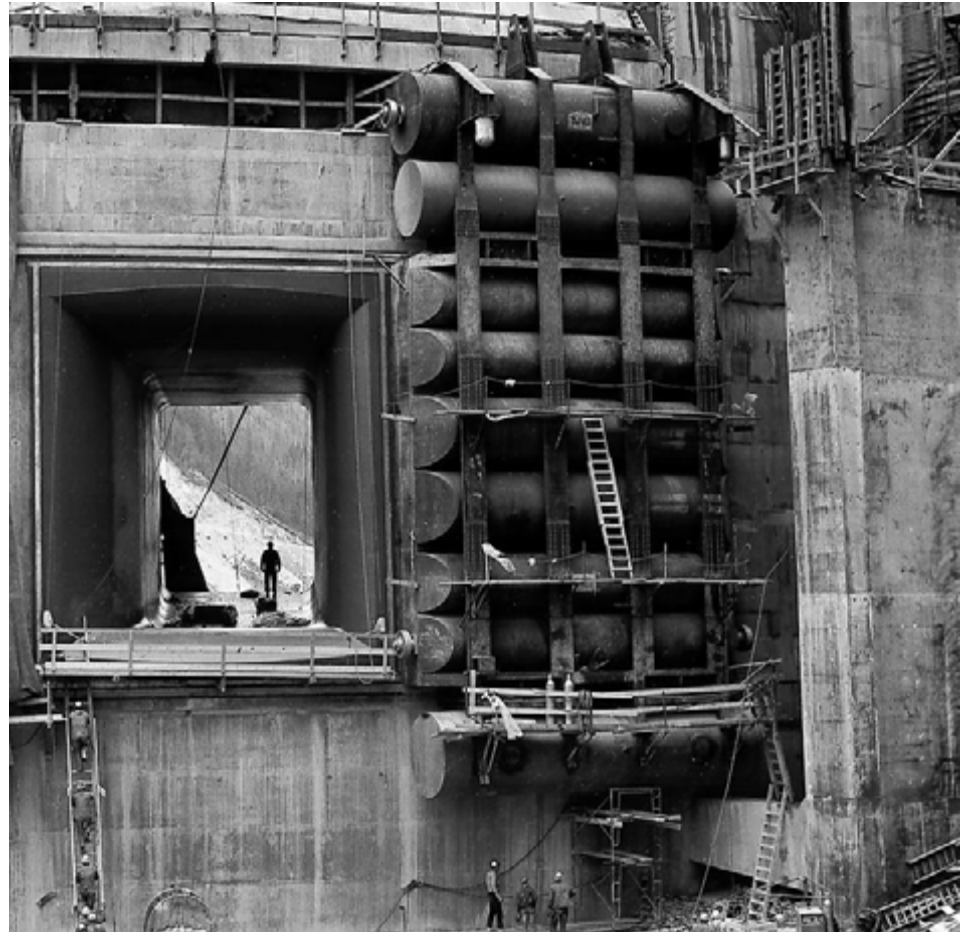


Description of Sluice Maintenance Gate Removal



Sluice Maintenance Gate (SMG) Outage

- SMG used to support maintenance of Sluice Gates
- Physical Characteristics:
 - Steel Construction
 - 72' tall x 32' wide
 - 310 tons
 - Air chambers used to float SMG during removal
- SMG is 200 feet underwater
 - For removal reservoir must be lowered from 1990' to 1960' elev. (InitialDraft, EnggDraft and GateFloat)
 - Additional Fill and Drafting needed to install dollies and remove gate from reservoir (LakeFill, DollyInst, DollyDraft)
- September 2010 outage requires removal and refurbishment

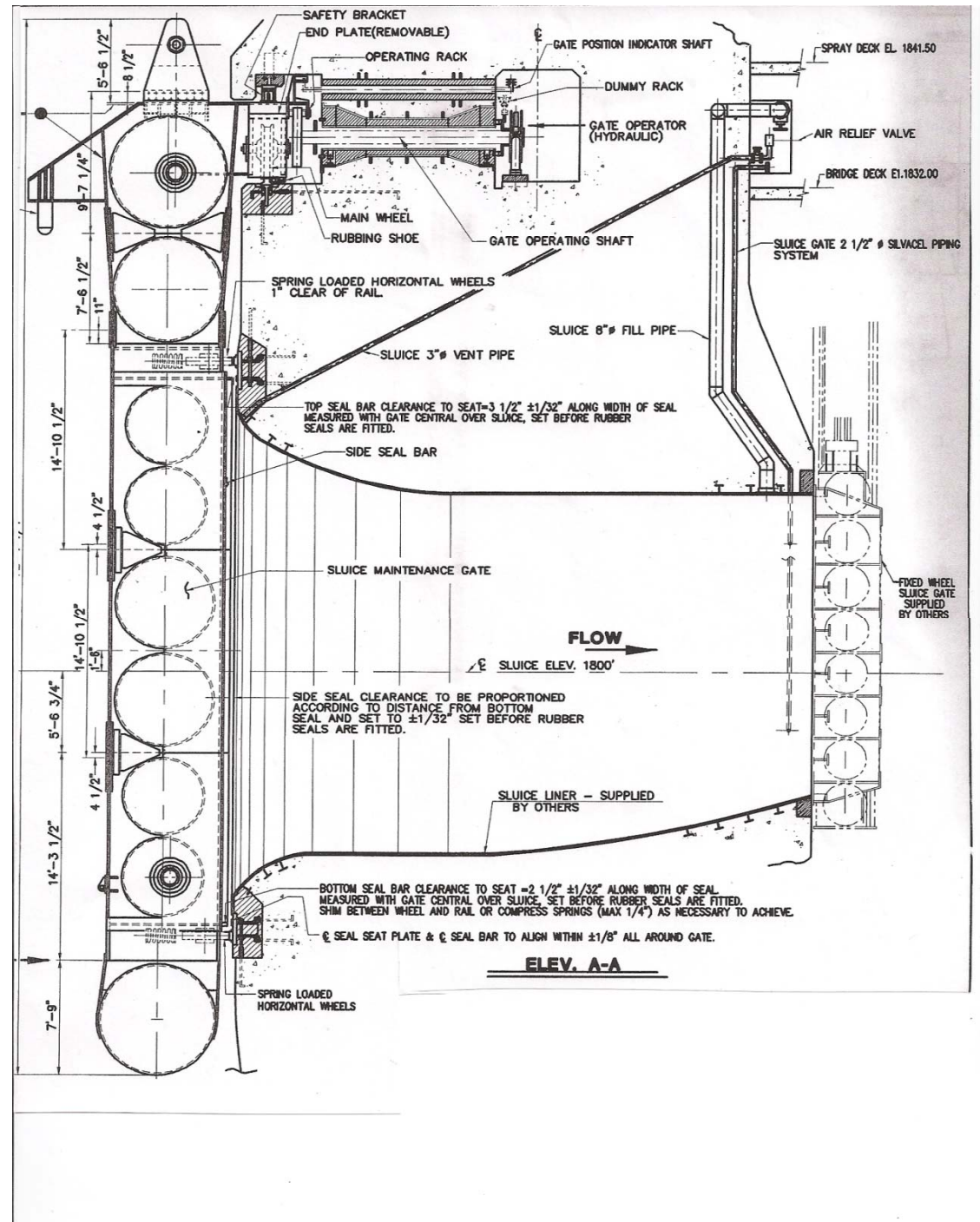


Normal Operation

How does it work?

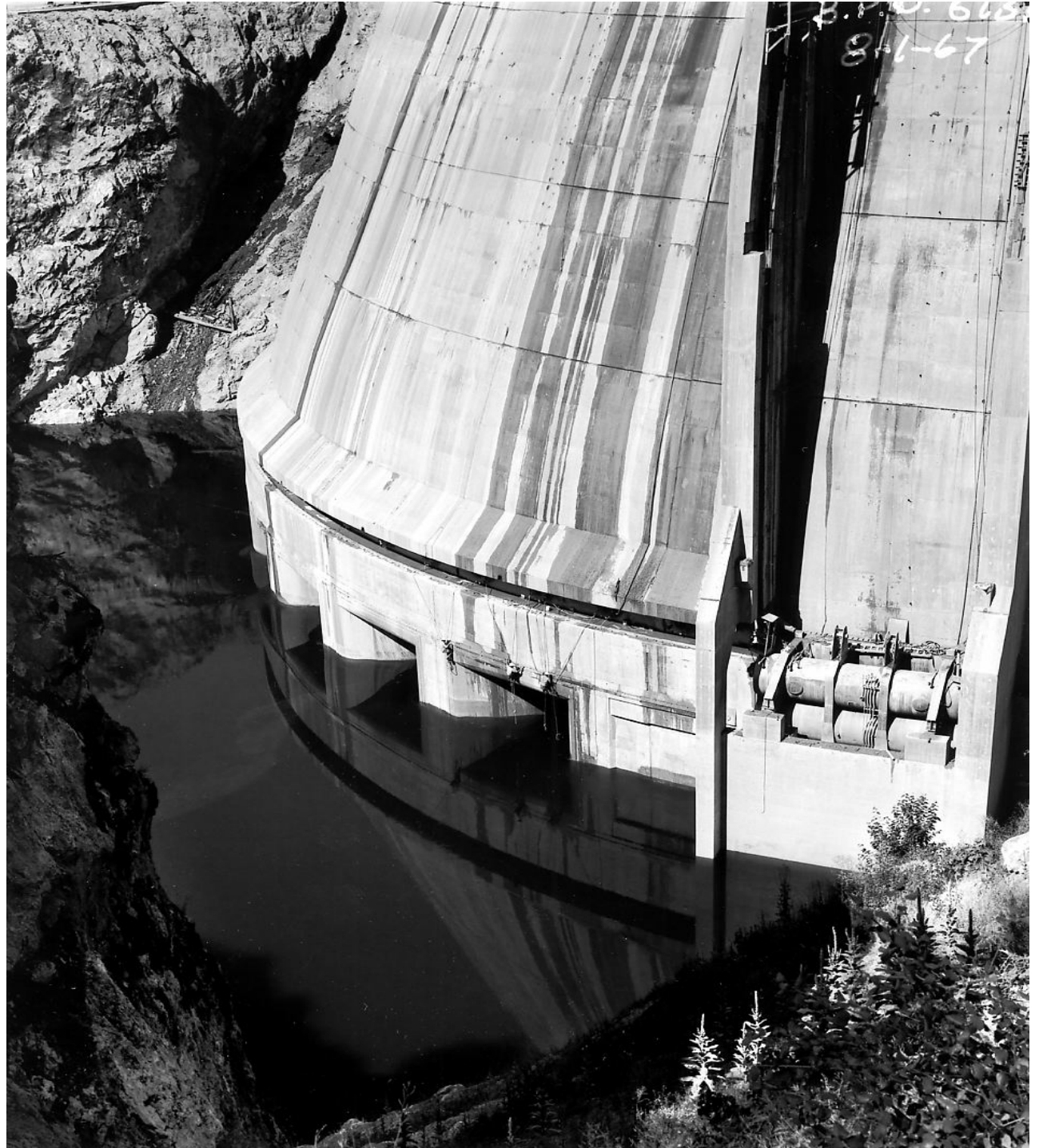
- Gate Operator
- Filled Tanks
- Air Tanks
- Wheels
- Sluice Gate

Importance to Dam Safety



Docking Bay For SMG

- Verify clear of debris

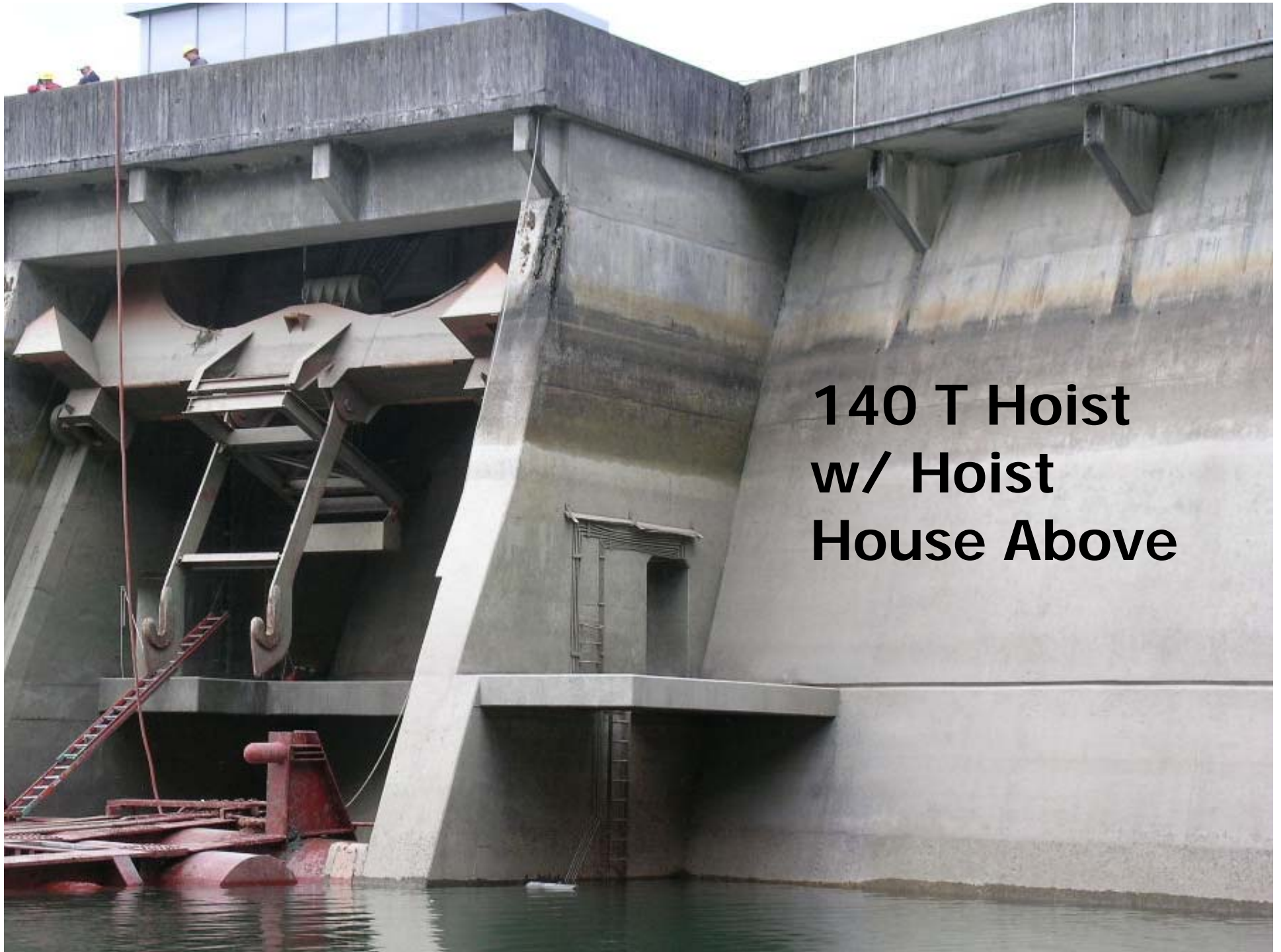


During SMG Outage



Other Work Done:
Inspections
Lidar/Sonar
Photo Records





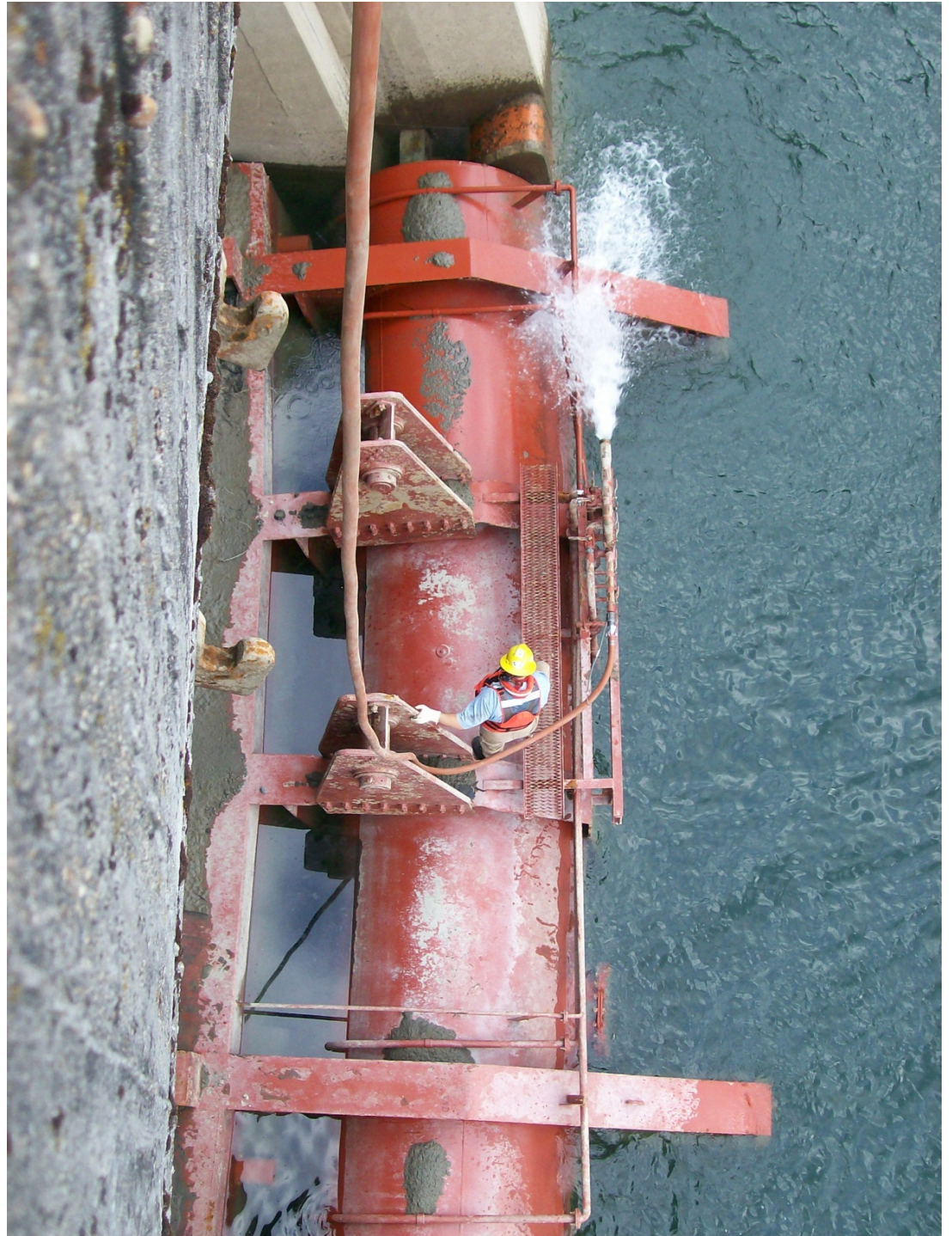
**140 T Hoist
w/ Hoist
House Above**





Piping Manifold

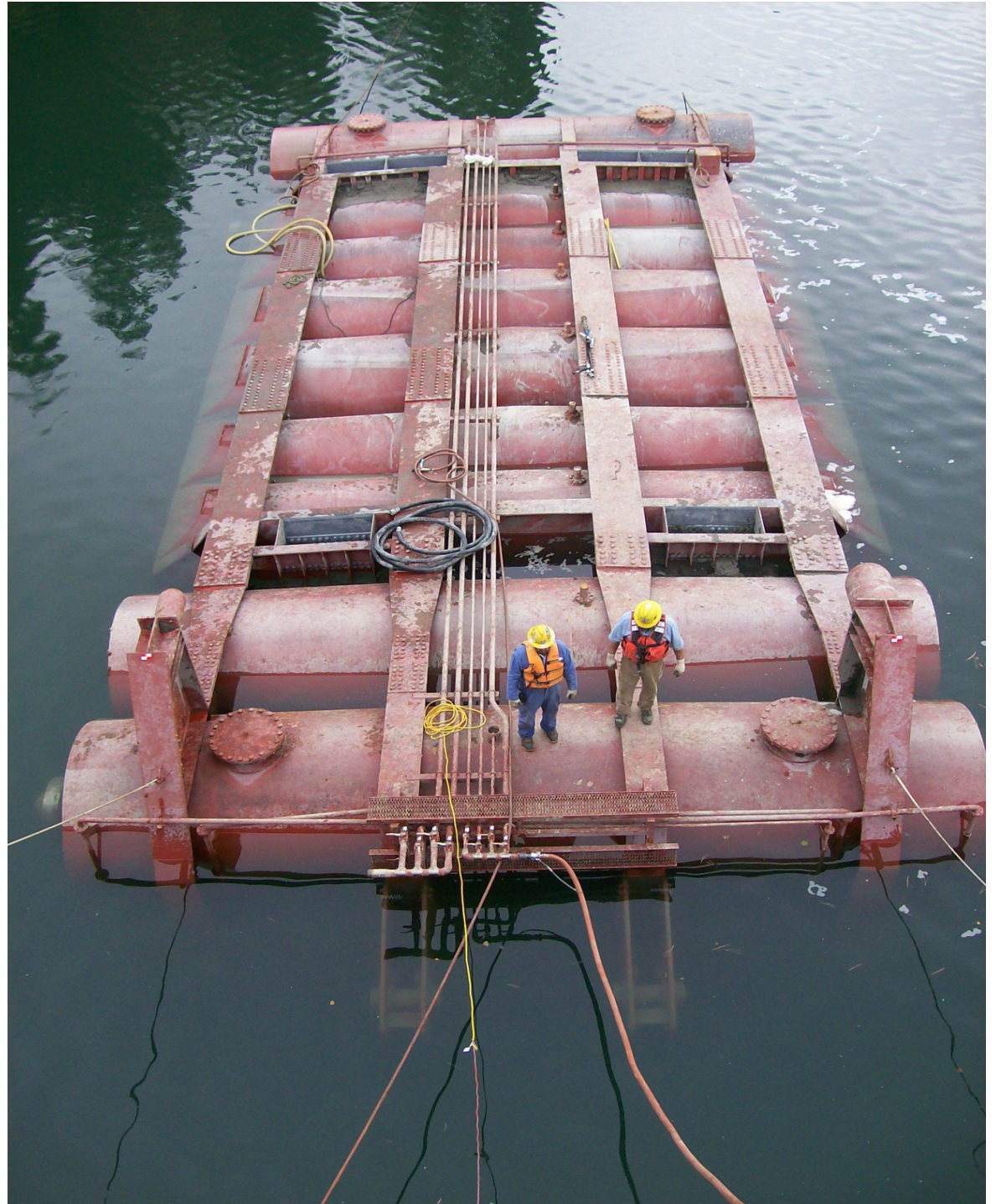
This view shows crew pumping water out of the top tank





Sluice Maintenance Gate as a Boat

-Raised
Reservoir







Two Broken Springs
-2 ¼" Diameter 17-4 SS

One Cracked Wheel

09/23/2010 08:59





100' x 50'
Concrete
Pad for Building

09/16/2011 08:52



09/16/2011 10:04







09/16/2011 17:55





09/19/2011 15:39



09/19/2011 15:44

Questions?

