

Grand Coulee Dam

Columbia River – Central Washington



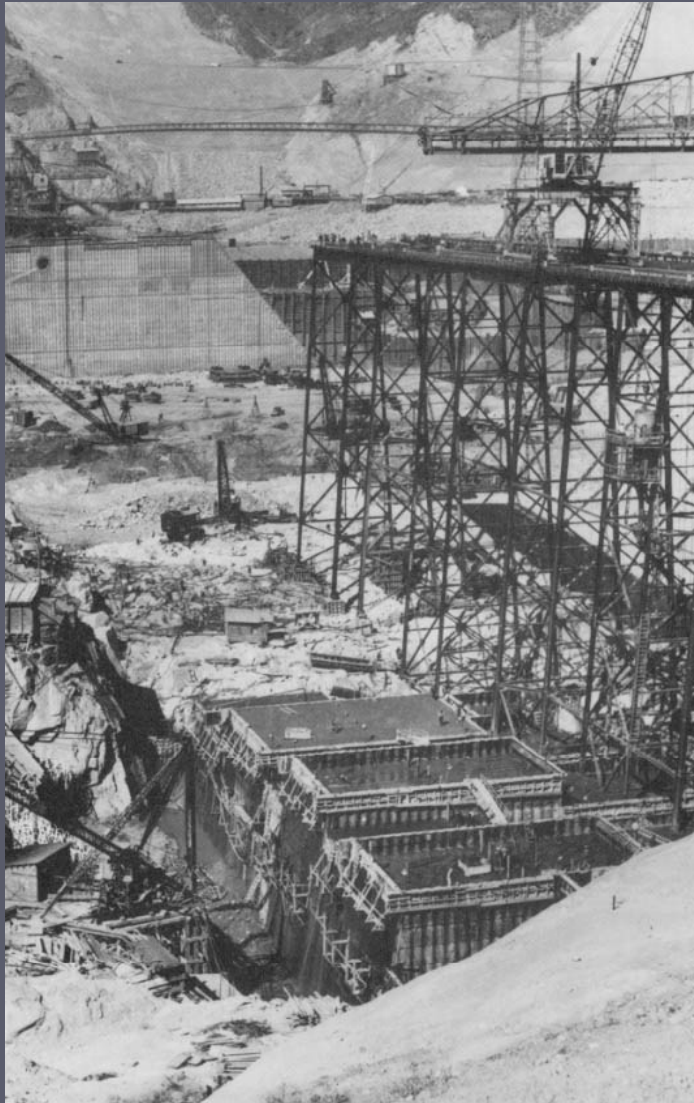
Becky Brosz

Objectives

- ▶ Irrigation
 - Original goal
 - More than half a million acres of farmland
- ▶ Hydropower
 - 24 generators - up to 6.8 GW
- ▶ Flood control
 - Regulates highly variable flows in Columbia River



Owners & Financing



- ▶ Managed by U.S. Bureau of Reclamation
 - Department of the Interior
 - Columbia Irrigation Project
- ▶ State of Washington
 - \$377,000 (1933)
- ▶ Franklin D. Roosevelt
 - \$63 million (1933)
 - Public Works Administration

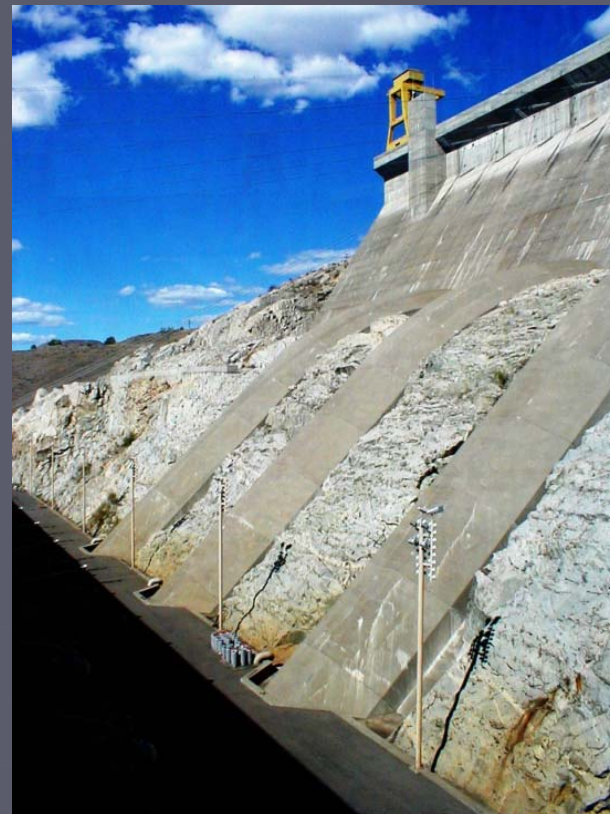
Technical Description

- ▶ Gravity Dam
- ▶ 5223 feet long
- ▶ 440 feet thick at the base
- ▶ 550 feet high
- ▶ 11,975,521 cubic yards of concrete
- ▶ Nine million acre-feet of water



Technical Challenges

- ▶ Getting enough materials
 - The railroad hauled
 - ▶ over twelve million barrels of cement (46,500 carloads)
 - ▶ 77 million pounds of reinforcing steel
 - ▶ and ten million pounds of steel for the penstocks
- ▶ Excavating earth
 - 2 mi long conveyor belt
- ▶ Cold weather
 - Steam through pipes in wet concrete to keep from freezing
- ▶ Hot weather
 - 2000 mi of cooling pipes



Technical Successes

- ▶ Pumping Plant
 - 6 – 65,000 hp pumps
 - 6 – 67,500 hp pumps
 - 12 - 12 ft diameter pipes
 - 1,600 – 2,000 cu ft per second
 - When reversed – 50 MW each
- ▶ Largest concrete structure in the United States
- ▶ Fourth largest hydropower producer in the world
- ▶ Largest hydropower producer in the U.S. (6.8 GW)



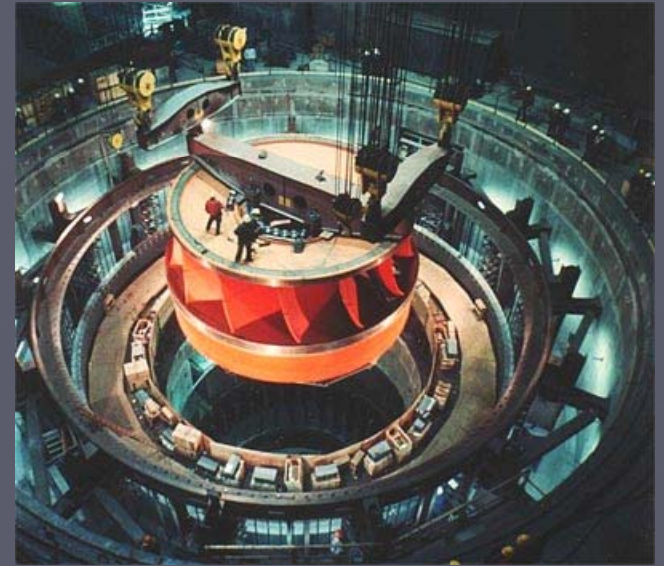
Benefits & Disbenefits

► Benefits

- Hydropower
- Flood Protection
- Tourism
- Irrigation
- Jobs

► Disbenefits

- Salmon
- Steelhead
- Colville Native Americans



Project Now

- ▶ Electricity generated has returned over \$4 billion
- ▶ Tourist attraction - laser shows, fireworks
- ▶ Efforts for fish – hatcheries, transport by truck



Remarkable Traits

- ▶ Woody Guthrie – folk singer hired by government to write pro-dam propaganda (26 songs)
- ▶ Wiped out more salmon than any single structure in American history.
- ▶ Colville Native Americans – fighting for money (15-25%, \$62 - \$103 million annually)
- ▶ Been called the 8th Wonder of the World



Questions

