Powering Colorado: Cabin Creek Hydroelectric Generating Facility

Legislative Water Resources Review Committee
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Cabin Creek Hydroelectric Generating Station

- Hydroelectric pumped storage power plant
- Located near Georgetown, at 10,018 feet above sea level
- Two units, each with a nameplate capacity of 150 MW
- Fuel Source – water supplied from two reservoirs totaling 1,977 acre feet
Cabin Creek responds to demand quicker than any other facility on our system

- Plant can start up and be fully loaded within 10 minutes; turn-around time is 15 minutes
- Pumped storage plant with a lower and upper reservoir, use during peak demand
- Electricity generated by releasing water from upper reservoir through a tunnel, which turns the turbine generators
- Water is then stored in lower reservoir
- Overnight when electricity demand is low, water is pumped back to upper reservoir
Cabin Creek Hydroelectric Generating Station – Black Start

- Cabin Creek has the ability to start up with only the use of station batteries
- Personnel are trained to conduct a black start
- Test procedure once a year
- Water volume maintained in the Upper Reservoir at all times for black start
- We can start Georgetown Hydro without external power and feed Cabin Creek if necessary
- Cabin Creek can then be used to start larger plants
Role Cabin Creek Plays in Xcel’s Distribution System

- Cabin Creek is also used as a “load-shifting” device
  - Generate when load is high; Pump when load is low
  - “Flattens” load curve by displacing peak load with off-peak load
  - Allows for greater wind penetration to load overnight
  - Can be “load-shifting” while carrying reserves
  - Traditionally will generate during super peak hours and pump during off peak hours
  - Effective cost of the hydro generation is reduced by using wind energy to replenish the upper pond overnight
FERC Cabin Creek License

- Issued in 1964; 50 year license; expires February 28, 2014
- License Application submitted February 27, 2012; includes,
  - Description of Project operations
  - Identify and Analyze the effects of ongoing Project Operations
  - Propose protection, mitigation, and enhancement measures during the new license term
  - Proposed Operational Upgrade
Cabin Creek Proposed Operational Upgrade

- Upgrade to the pump-generating equipment
  - From 300 MW (nameplate) to 336 MW
  - Increase turbine efficiency from 86% to 91%
- Expand Useable Storage Capacity in the Upper Reservoir
  - Increase storage by approximately 75 ac-ft
  - Storage increase completely contained within existing reservoir
  - Only minor changes to the parapet wall to pass design flood needed
New License Issuance - Status

- Expect FERC’s Environmental Analysis of the Project, including the proposed upgrade, any day
- Expect that the License will be issued prior to expiration of current License
- Xcel Energy will conduct a final assessment and financial feasibility of the upgrade once the License is issued
Questions?