TransAlta Hydro Operations Tour
University of Alberta Energy Club
March 28, 2014
Agenda

- Introductions
- Safety Orientation
- TransAlta Corporate – operational overview
- Birth of TransAlta – the Horseshoe plant
- Horseshoe at glance
- Kananaskis at glance
Safety Orientation

- TransAlta is commitment to safety
- Care and Custody
- Field level hazard assessment
FLHA

- Site visitors to be under care and control of tour facilitators – live energized facilities
- Extreme ambient temp, ice and snow fall hazards
- Ice and snow slipping hazards – plant access
- Hazardous energy – Electricity, high head pressure, rotating/reciprocating machinery
- PPE required inside the facilities
FLHA - continued

- Other on site work groups
- Noise exposure on the plant floor
- On site emergency equipment
- Emergency response plan, emergency dispatch and plant location information
- Muster areas
About TransAlta

- Canada’s largest publicly traded generator and marketer of electricity and renewable power
- Energy sources: coal, natural gas, wind, hydro and geothermal
- Over 70 facilities in three geographies: Canada, the United States and Australia
- Headquartered in Calgary, Alberta
- Over 100 years of experience

**Net Capacity Owned by Fuel Type**
(In Operation & Development)

- Coal: 55%
- Gas: 21%
- Wind: 12%
- Hydro: 10%
- Geothermal: 2%

**Net Capacity Owned By Geography**
(In Operation & Development)

- Canada: 73%
- United States: 22%
- Australia: 5%
Alberta Hydro

- Geographically diverse, centrally dispatched
- Operations, Maintenance and Engineering centered around the plants
- Major resources based out of Calgary and the Bow Valley
Alberta Hydro

Bow River
326 MW

11 Plant Cascading System
Electricity in Calgary

- History of the Horseshoe Power Plant is linked to the growth of Calgary
- By 1887, Calgary (with a population of about 3000) had ten 40watt streetlights, supplied by the Calgary Electric Lighting Company
- 1889 Peter Prince founded the Calgary Water Power Company
Electricity in Calgary

- Extreme growth in Calgary at the turn of the century
- As the city grew, with electricity shortages, eventually the City of Calgary government built its own coal-fired electrical generating station right in Calgary, using coal from the Bankhead mine near Minnewanka.
- Power prices were high
Calgary Power, our predecessor company got its start in the early 1900’s on a train journey across Canada.

Max Aitken happened to be looking out the window and saw some undeveloped hydro sites in the Rockies.

He sent his friend R.B. Bennett to investigate.

Together they saw a niche for providing power to the city of Calgary.
TransAlta / Altalink Early History

- Business plan: control all of the best Bow River hydro sites, and with this cost effective supply, dominate Calgary’s power supply.
- The hydro would also offer cheap power to Aitken’s cement plants in Exshaw and Calgary.
- In 1909, Aitken became the president of Calgary Power, and his good friend R.B. Bennett manager of operations.
- Design of the Horseshoe Falls plant started in 1909 and construction in 1910.
Horseshoe Construction

- 200 workers hired.
- Disaster: In May, 1910, spring runoff arrived suddenly with greater volume and force than anticipated
- Torrents of water washed away the wooden forms, cofferdams, spillways and incomplete foundations!
- Faulty estimates of river flows was a serious miscalculation
- Bennet and Aitken furious – fired the engineers and brought in Montreal Engineering
Horseshoe

- First power from a new transmission line delivered to Calgary on May 21, 1911
- First contract with the City of Calgary was $30/HP/year (this works out to about $5/MWh).
- This was about ½ the price of the coal fired generation in Calgary using Bankhead coal
Horseshoe Plant – at a glance

- Approximately 80’ of vertical head
- Run of the river facility
- 4 units, 14MW total plant capacity
- Averages about 84,000 MWh each year
Kananaskis Construction

- Kananaskis dam and power plant were constructed in 1913.
Control Centre
Kananaskis Plant – at a glance

- First two unit built in 1913, third unit added in 1950’s
- Three generators, 19MW plant capacity
- 93,500MWh annual production
Hydro Generation


https://www.youtube.com/watch?v=3BCiFeykRzo

Courtesy of http://water.usgs.gov/edu/hyhowworks.html
Thank you