

# New Conventional Development

**Vernon Project – Unit 5-8 Re-powering**

**Fifteen Mile Falls Project – Comerford Runner Upgrades**

NHA Northeast Regional Meeting  
Holyoke, MA September 10, 2008



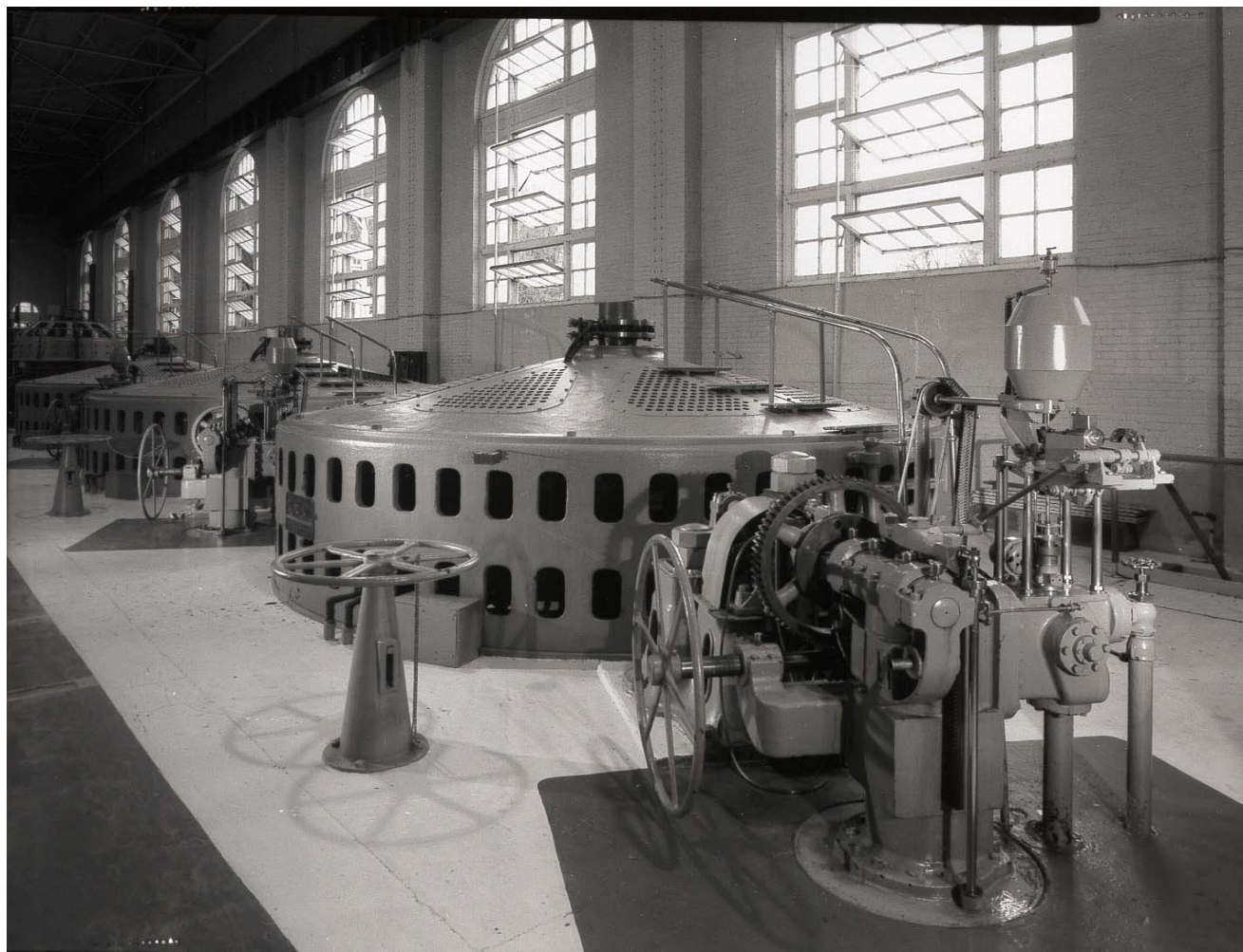
# TransCanada's North American Assets



# Vernon Project Unit 5-8 Re-Powering



## Vernon Project Background



### Original Units 5-8

- Built in 1907-1909;
- Triple-runner design;
- 2-mw each
- Retired 1992 – 2006
- Re-powered with 4-mw vertical axial flow kaplans



# Vernon Project Unit 5-8 Re-Powering



## Challenges

- Historic Structure circa 1907
- New Units required substantial powerhouse structural demolition, modification and construction in a precise sequential order to maintain integrity.
- Units had been retired for quite a while and so siltation and corrosion was significant
- Had to deepen draft tube, requiring bedrock removal
- Fish ladder was below powerhouse
- Bald Eagle nest downstream

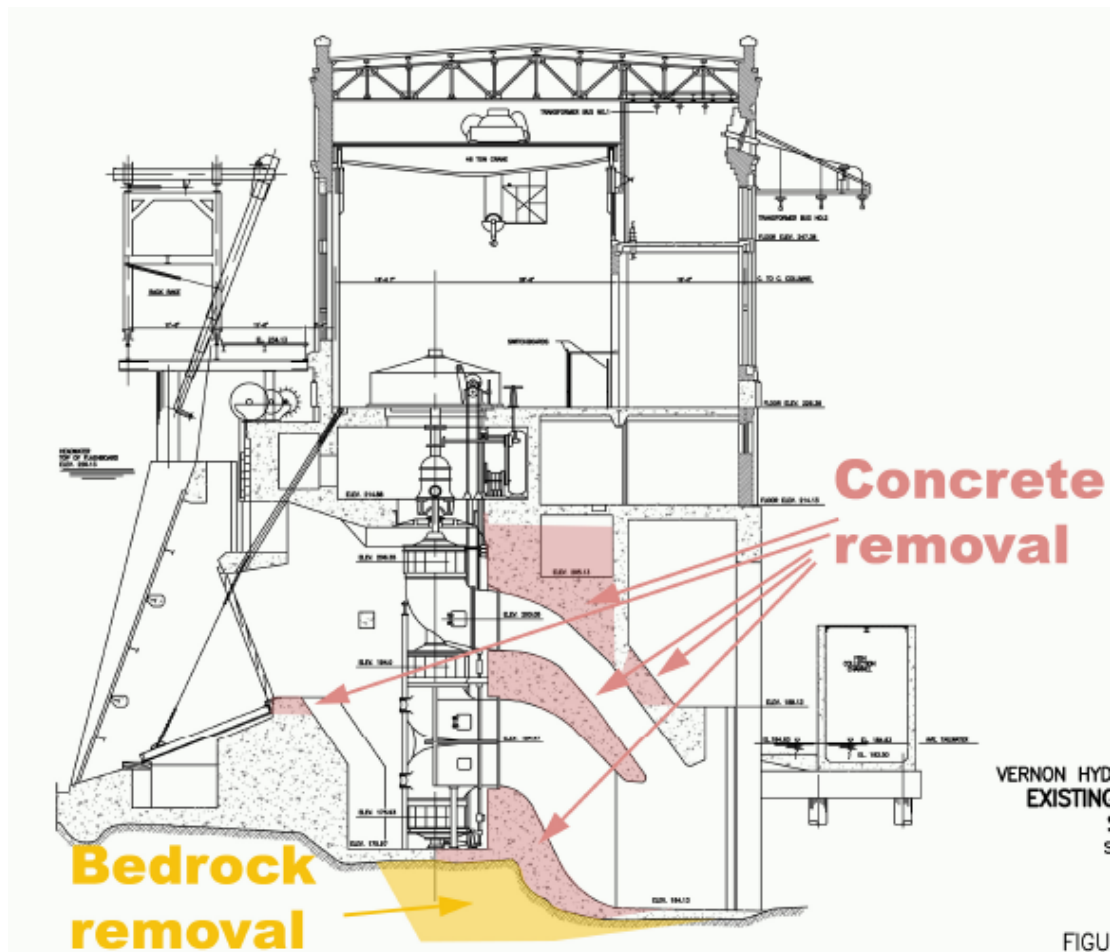
# Vernon Project Unit 5-8 Re-Powering

Historic Structure circa 1907





# Vernon Project Unit 5-8 Re-Powering







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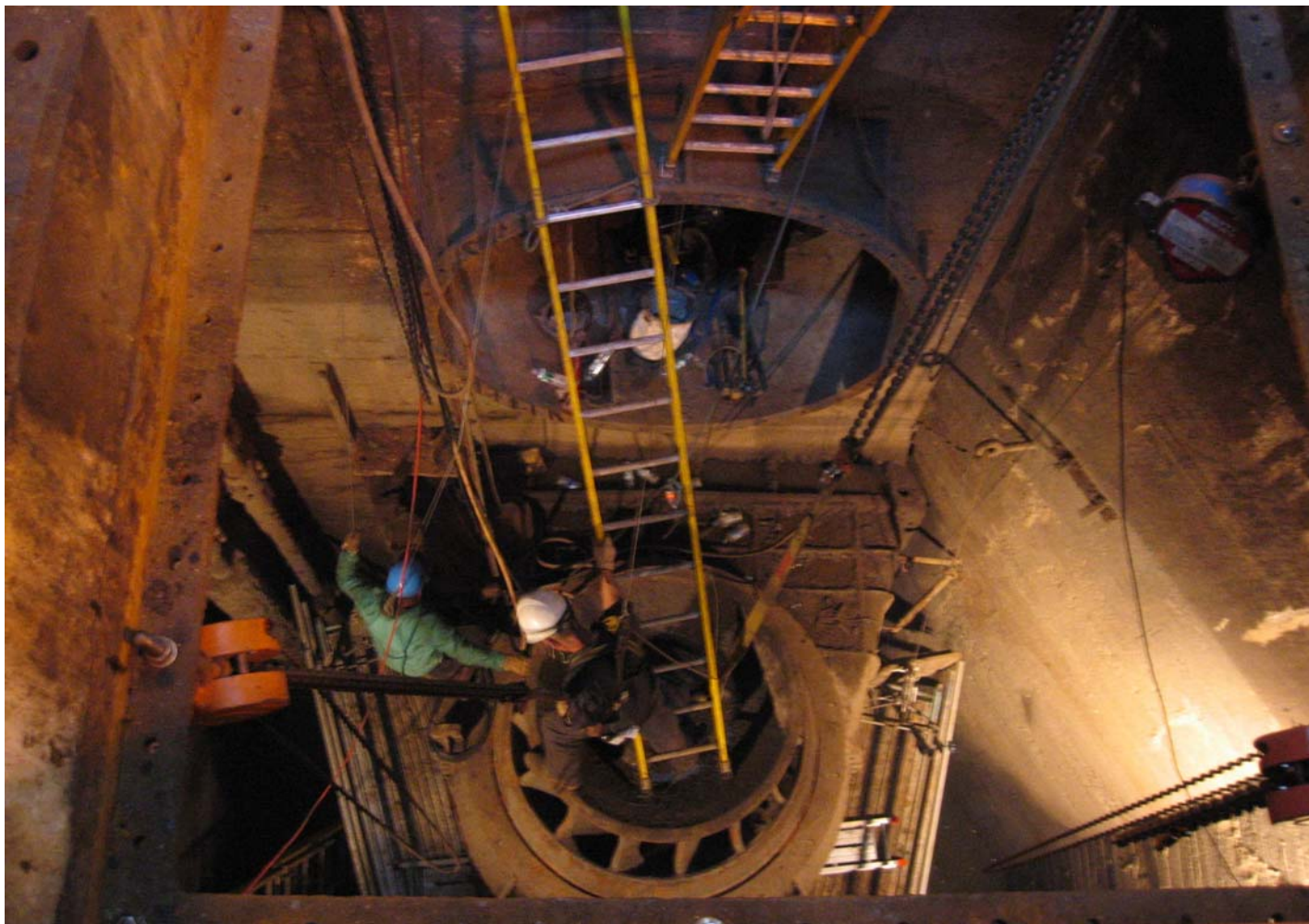




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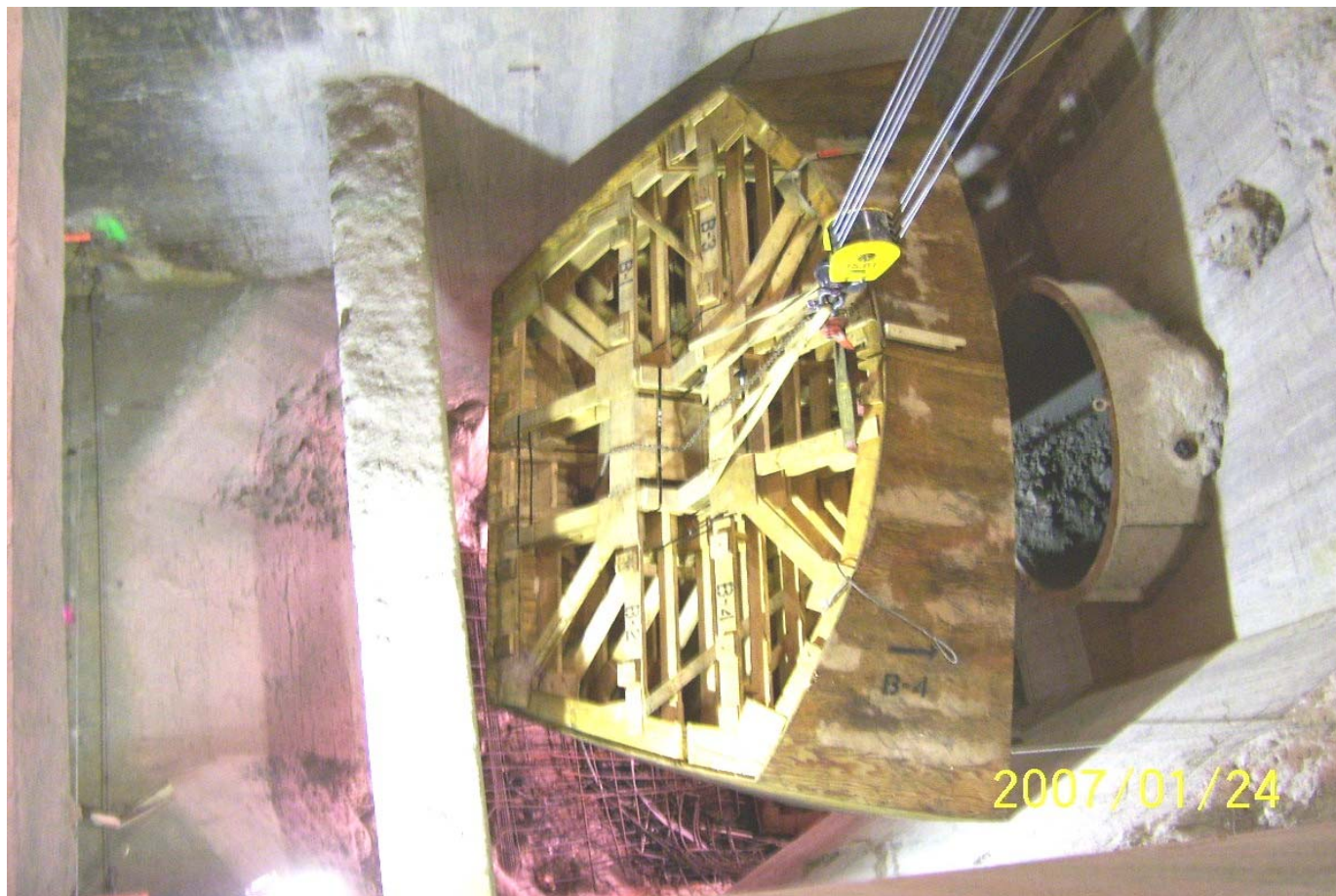




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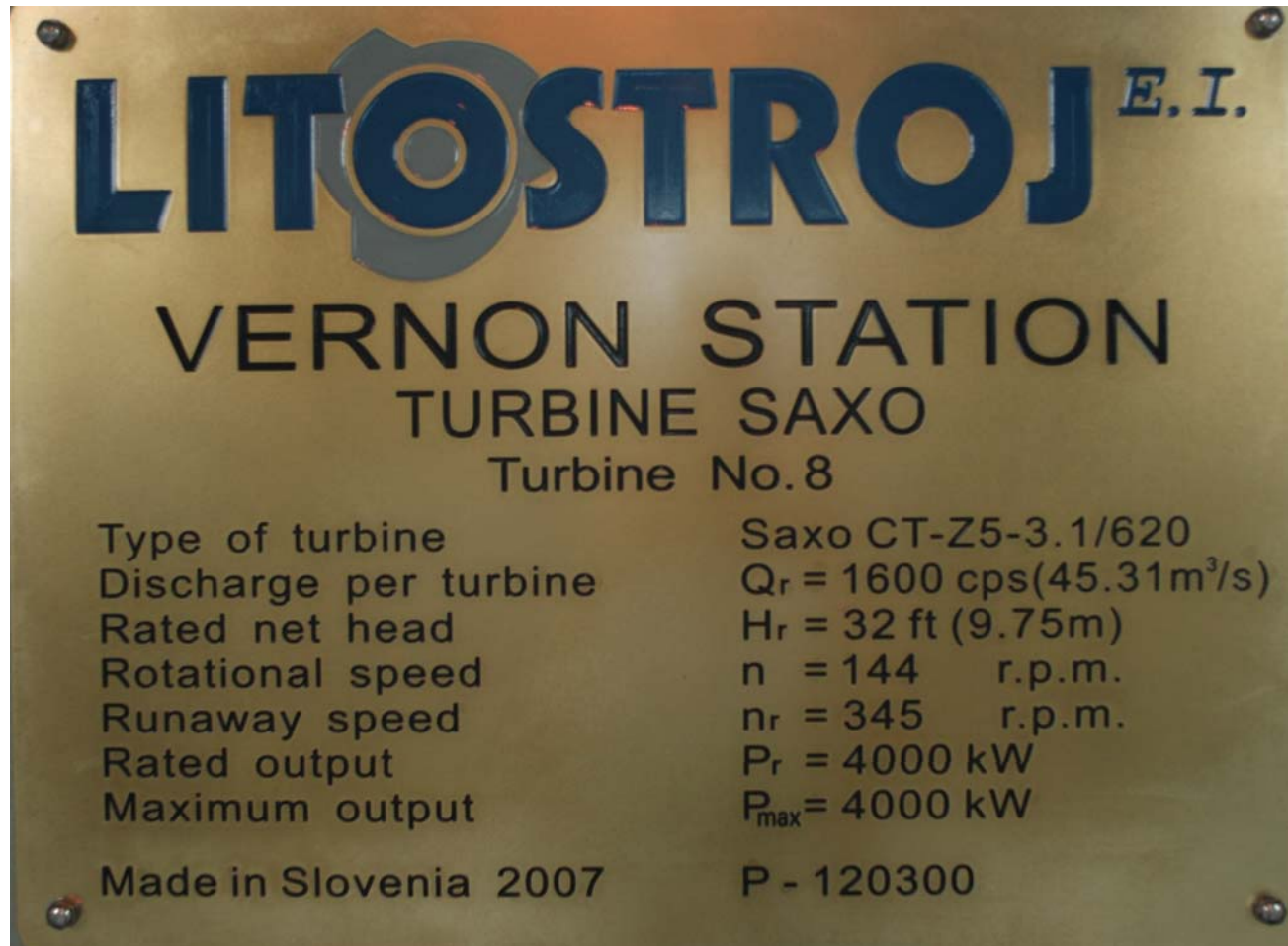




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# Vernon Project Unit 5-8 Re-Powering



## Summary

Type of Improvement	Additional Capacity and Improved Efficiency
Date of Operation	May 1, 2008
Historical Generation Baseline (kWh)	135,453,000
Generation with Improvements (kWh)	191,854,000
Incremental generation (kWh)	56,401,000
Percentage of Future Generation Due to Improvements	29.4%

# Comerford Runner Replacement Project



# Comerford Runner Replacement Project



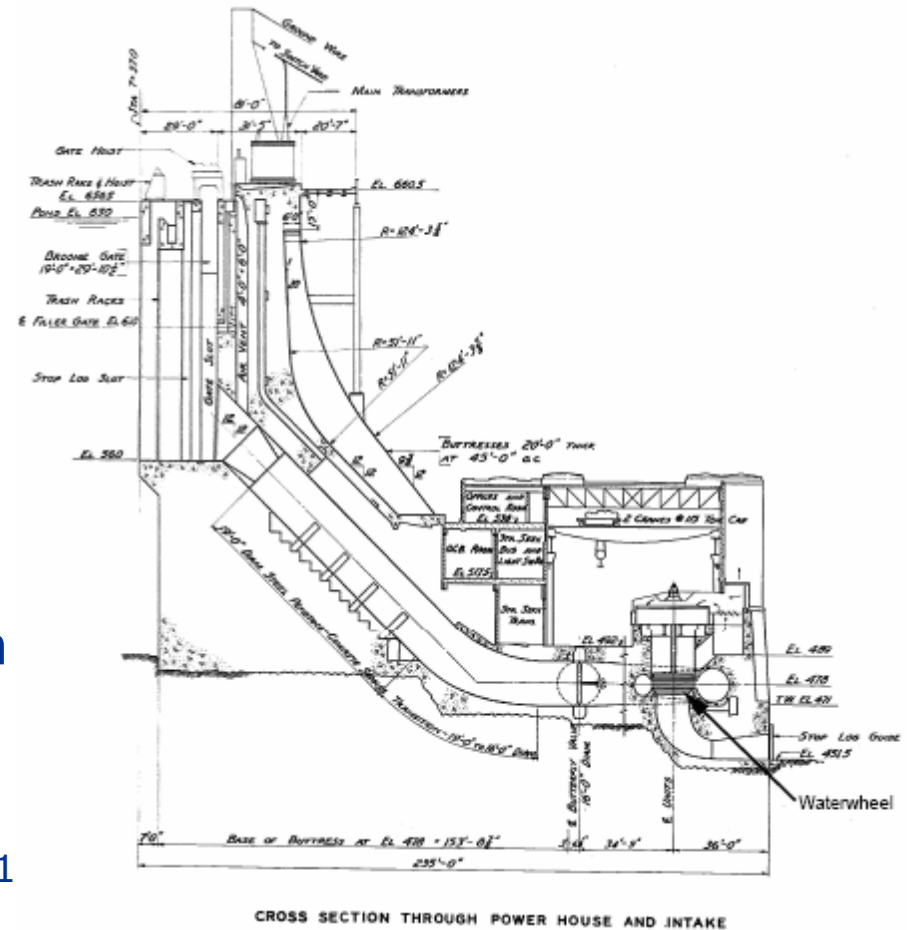


# Comerford Runner Replacement Project



## Original Configuration

- Four 40-mw units;
- Francis runners
- 180 feet net head
- 3300 cfs each
- Average of 364,000 MWh's annually
- Relicensing resulted in new seasonal flows
  - 818 cfs from 6/1 to 9/30
  - 1,145 cfs from 10/1 to 5/31
  - 1,635 cfs from 4/1 to 5/1



# Comerford Runner Replacement Project



## Unit 1 Runner replacement

- Replace 40-mw runner with new runner designed for greater efficiency at new minimum flows
- Loss of 18 mw of capacity
- New runner is over 90% efficient between flows of 800-1600 cfs.
- Maximum flow 1700 cfs
- Efficient generation at minimum flow
- More efficient generation at mid-points between incremental flows of 3300 cfs.
- Gain of 23,000 MWh's annually; 6.7% increase
- Installed April 2007



# Comerford Runner Replacement Project



# Comerford Runner Replacement Project

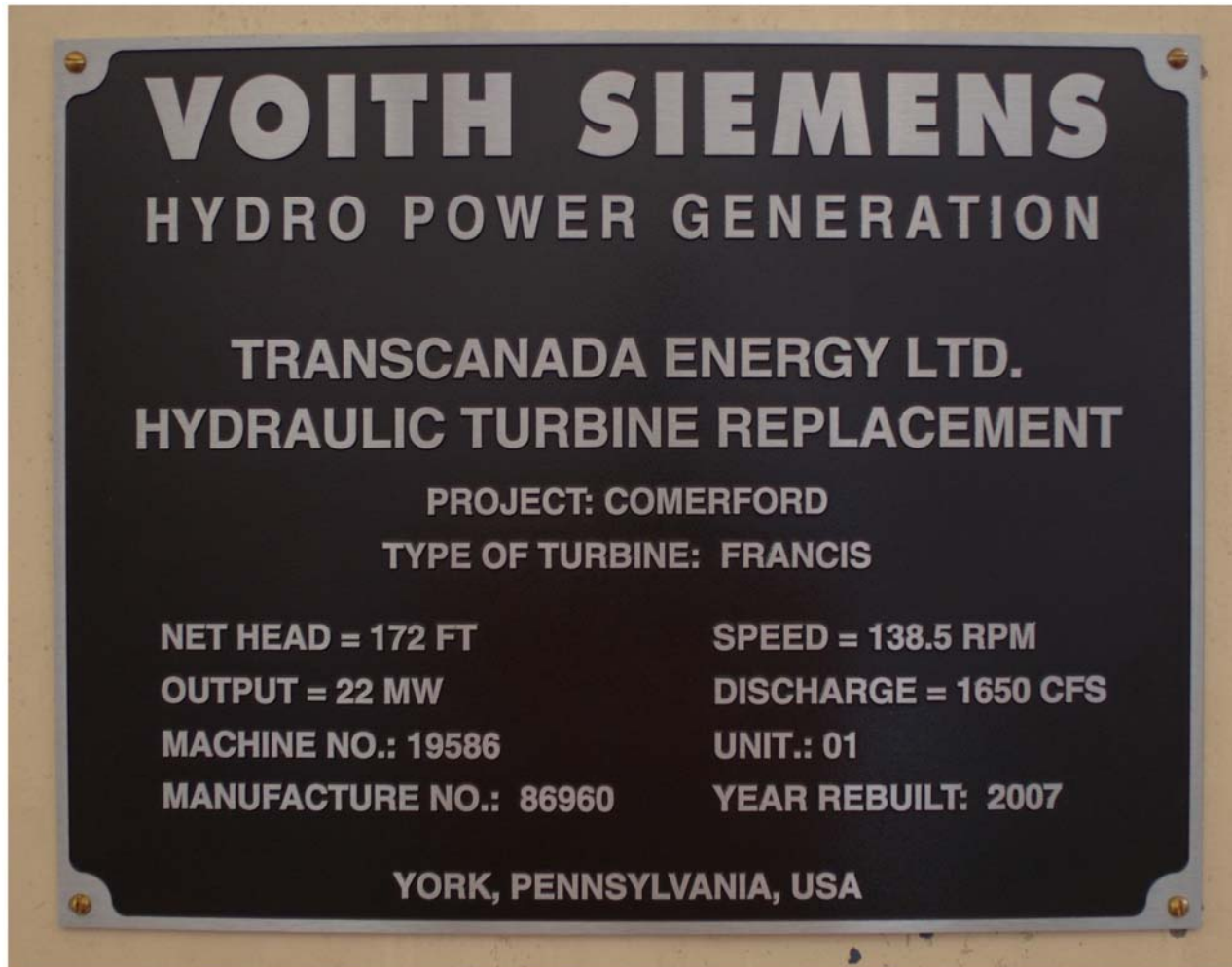




# Comerford Runner Replacement Project



# Comerford Runner Replacement Project



# Comerford Runner Replacement Project



## Units 2-4 Runner replacement

- Replace 40-mw runners with new runners designed for greater efficiency at existing maximum flow
- Associated generator rewinds
- Maximum gain of 24-27 mw of capacity
- More efficient generation at maximum flows producing additional 2400 MWh's annually
- Planned for 2009-2013



# Future Opportunities?

