

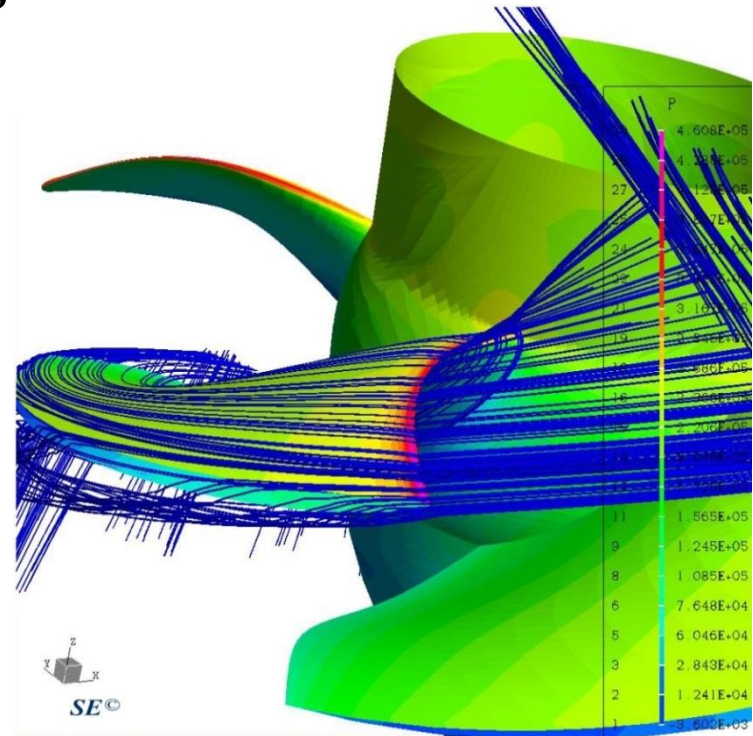
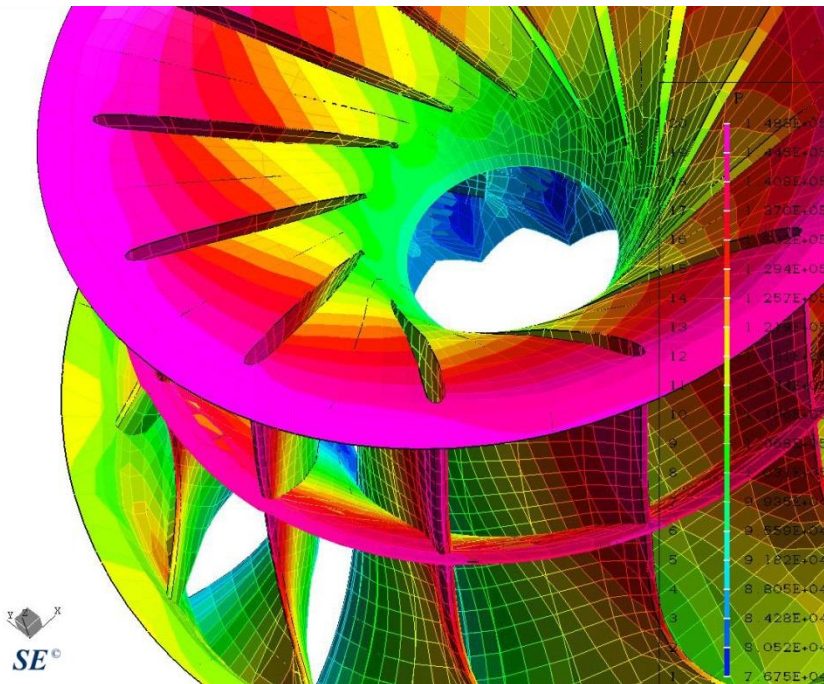
NORCAN HYDRAULIC TURBINE INC.



About Norcan

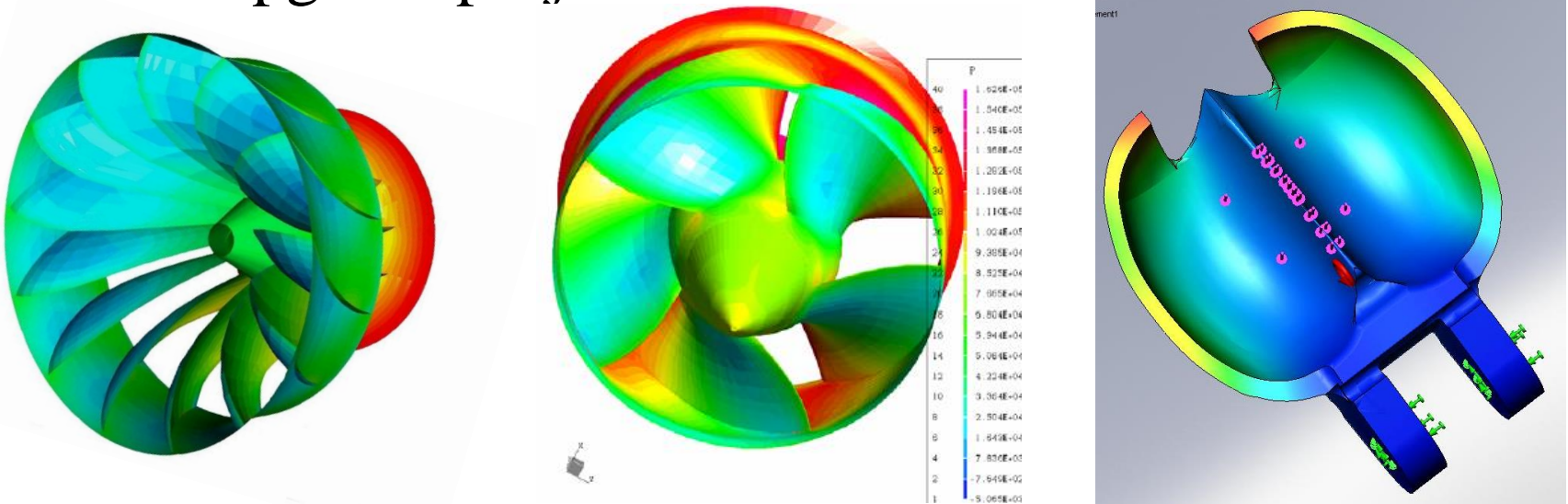
- Norcan was established in 1992 by Joe Martin and Ron Levesque
- Norcan's 20, 000 sq. ft. manufacturing and assembly facility is located in Carleton Place, ON Canada
- Norcan supports the hydro-electric industry in Canada, U.S.A, and International markets with Eng./Design, Manufacturing and Installation/Maintenance capabilities.

- Norcan specializes in upgrade/refurbishment projects in the ranges of 200kW to 30MW.
- These projects are custom Retro-Fit to maximize efficiency for each individual site.
- Custom Runner Designs are created through the use of CFD/FEA Analysis



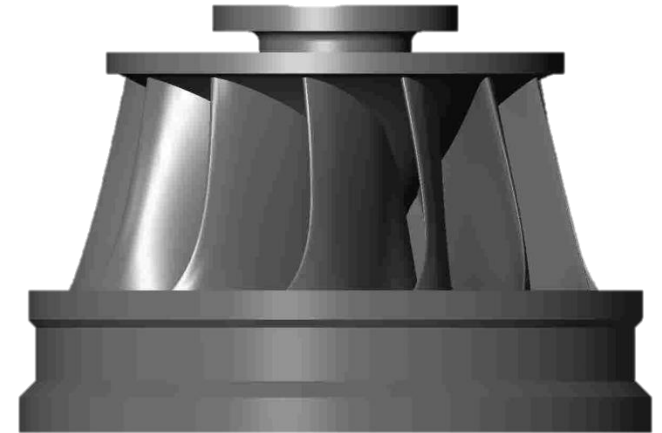
Types of Turbines

- The three most common types of Hydro-Electric Turbines are Francis, Kaplan and Pelton
- Each type of Turbine has several variations to accommodate the diversities at each site, therefore Norcan creates a Custom design Runner model for each upgrade project.



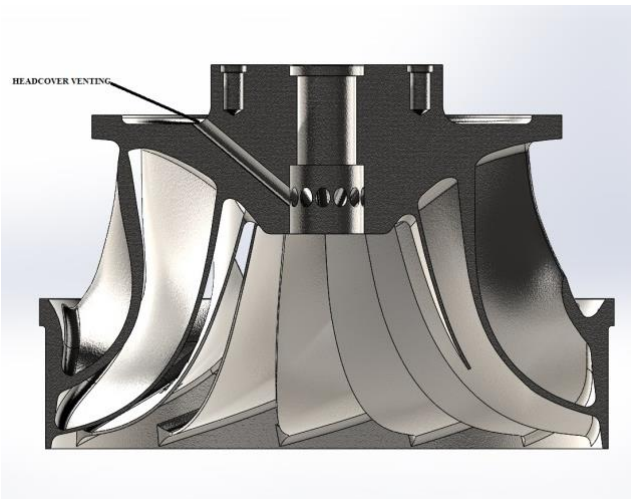
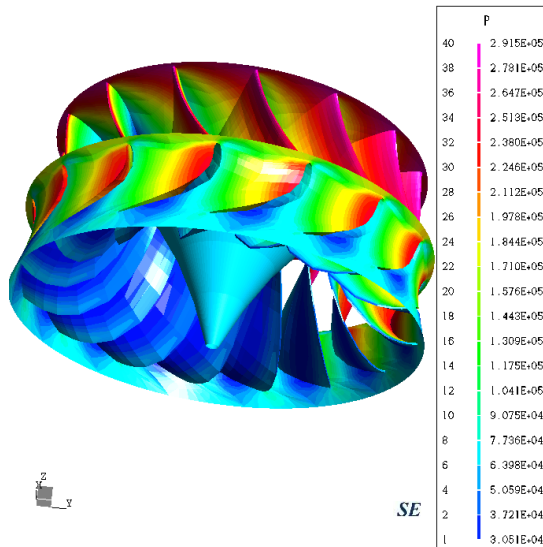
Francis Turbines

- Medium-Low Head Sites
Medium-High Head Sites
- Configurations:
 - Vertical Francis
 - Horizontal Francis
 - Camelback
 - Double Discharge



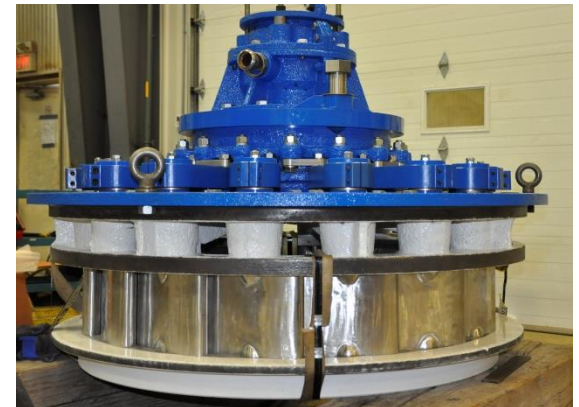
Francis

- Proctor, Units 2, 3, 4 – Vermont, USA
- Supply: Turbine / Generator package
 - Runner Diameter: 899mm / 35.4 inches
 - Net Head: 32.92m / 108ft
 - Output: 1957kW each



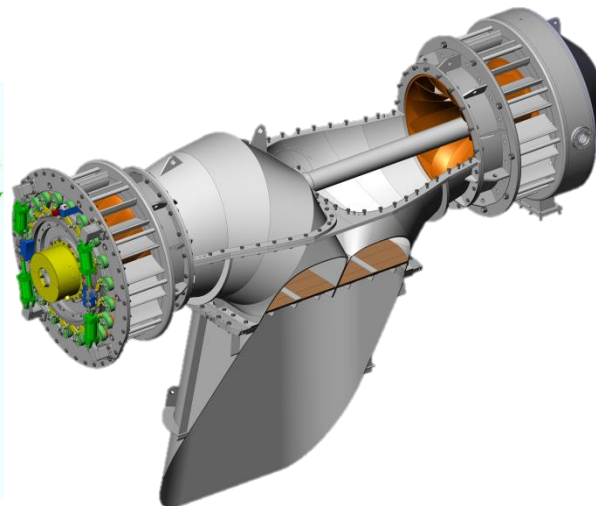
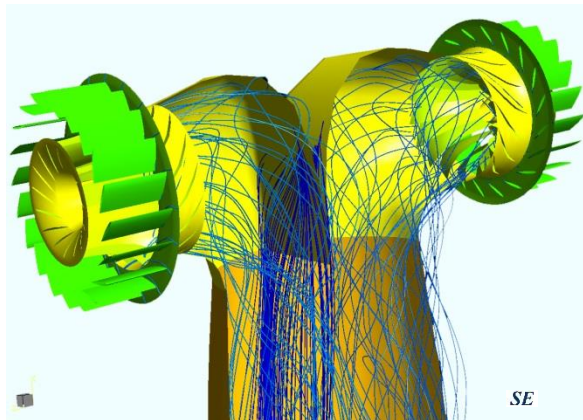
Francis

- Proctor, Unit 1– Vermont, USA
- Supply: Upgraded Runner / Refurbish Distributor
 - Runner Diameter: 1013mm / 39.90 inches
 - Net Head: 32.30m / 106ft
 - Output: 2039kW



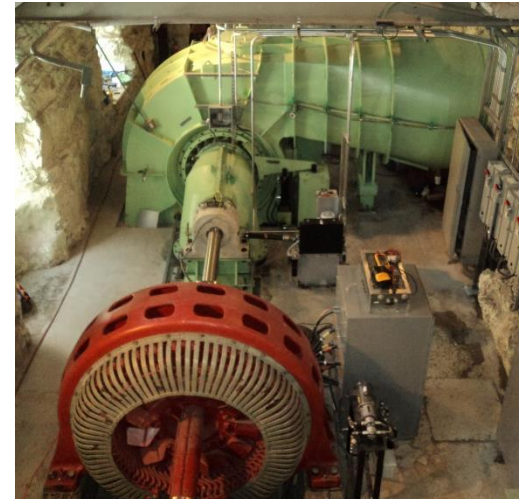
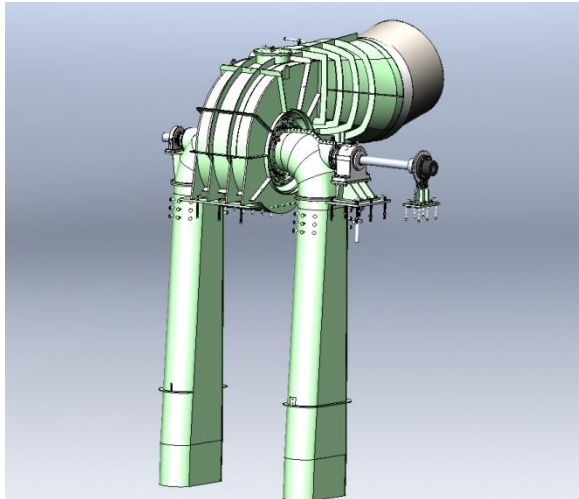
Francis Camelback

- Sturgeon Falls Units 3 and 7 – ON, Canada
- Supply: Upgraded Camelback Turbine
 - Runner Diameter: 1320mm / 52 inches
 - Net Head: 12.54m / 41.14ft
 - Output: 1842kW each



Francis Double Discharge

- Carver Falls – VT, USA
- Supply: Upgraded Double Discharge Turbine
 - Runner Diameter: 673mm / 26.5 inches
 - Net Head: 34.0m / 112ft
 - Output: 1600kW



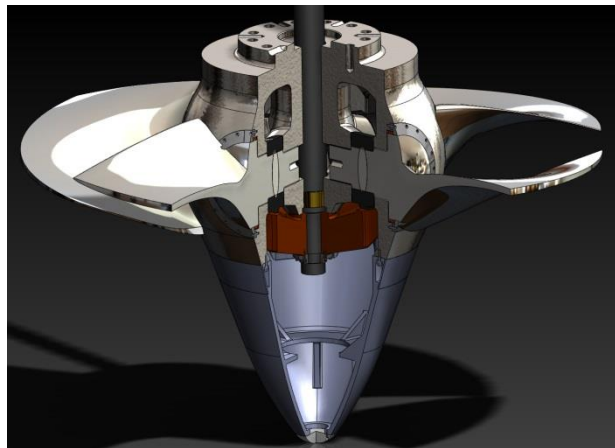
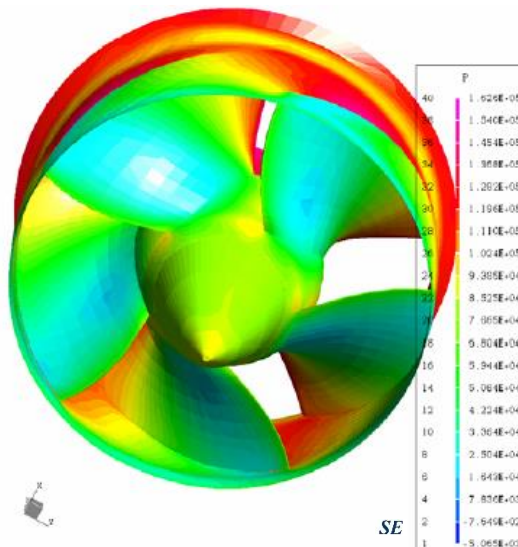
Kaplan Turbines

- Low Head Sites
- Configurations:
 - Conventional Kaplan
 - Saxo
 - S-Turbine
 - Pit
 - Bulb



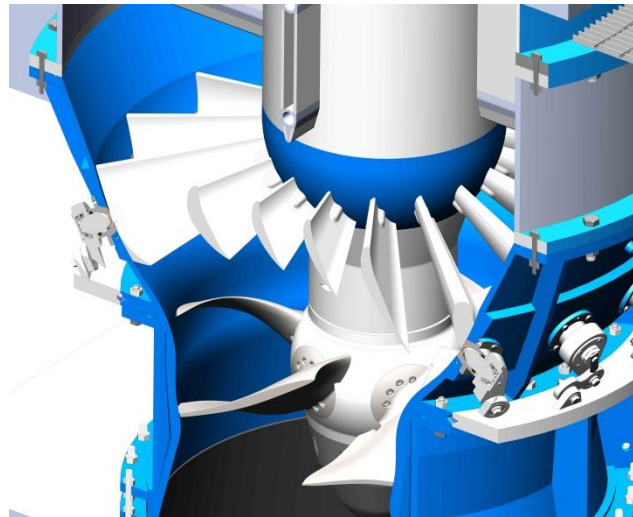
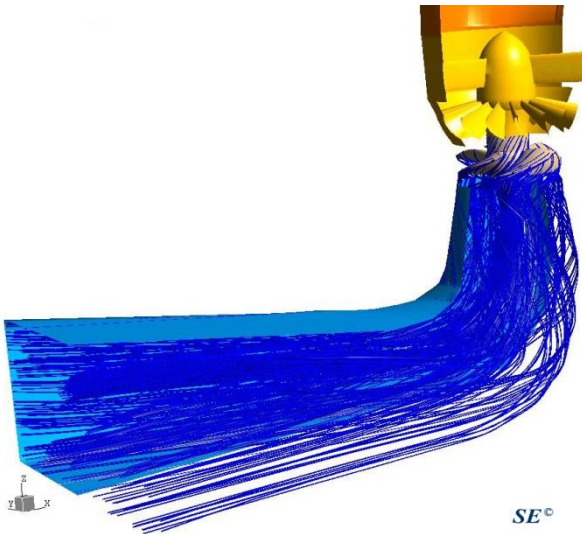
Conventional Kaplan

- Madawaska – NB, Canada
- Supply: Water – to – Wire
 - Runner Diameter: 3250mm / 128 inches
 - Net Head: 9m / 29.5ft
 - Output: 4.0MW



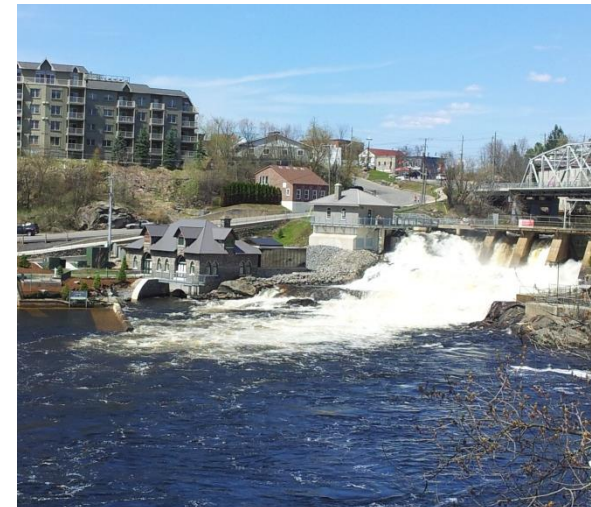
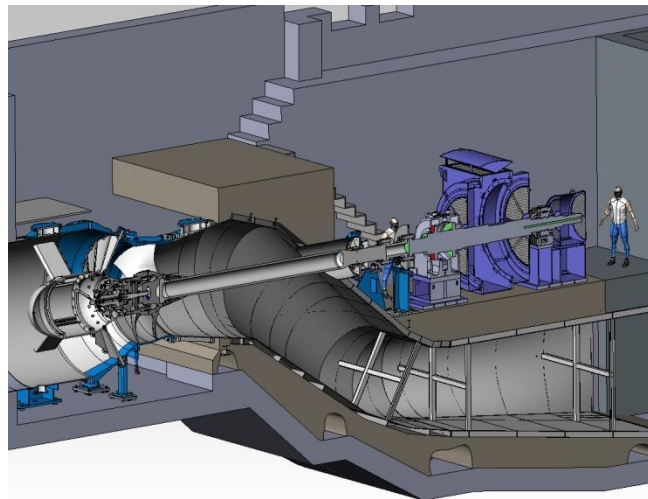
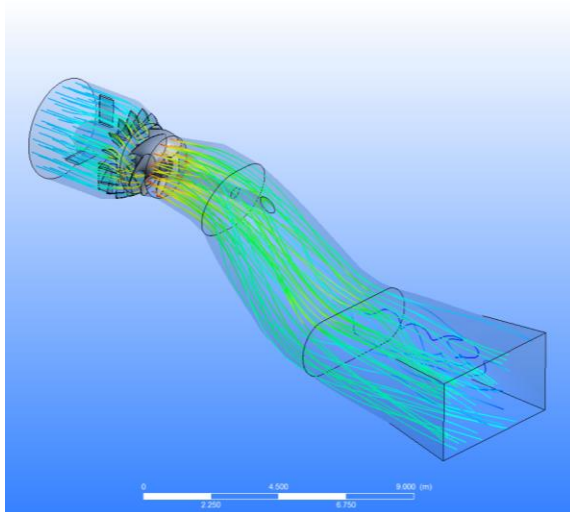
Saxo

- Thomas Low – ON, Canada
- Supply: Turbine / Generator Units #6 and #7
 - Runner Diameter: 1400mm / 55 inches
 - Net Head: 22.23m / 72.9ft
 - Output: 2.0MW



S-Turbine

- Bracebridge – ON, Canada
- Supply: Turbine / Generator
 - Runner Diameter: 2108mm / 83 inches
 - Net Head: 10.36m / 34ft
 - Output: 2446kW



Pelton Turbine

- High Head sites
- Configurations:
 - Single and Multi-Jet horizontal (Single Runner)
 - Single and Multi-Jet horizontal (Double Runner)
 - Multi-Jet vertical Single Runner



Pelton Turbine

- Bishop #6 – CA, USA
- Supply: Two Replacement Runners
 - Runner Diameter: 1930mm / 76 inches
 - Net Head: 65m / 220ft
 - Output: 2.2MW

