

**2001 HYDRO R&D FORUM
RESEARCH SYNOPSIS**

Project Title:

Bonneville Power Administration Turbine R&D Program

Keywords:

Turbines, Flow Measurement, Bearings, Optimization

Scope of Project:

- 1) Flow Measurement in Kaplan Turbines
 - absolute flow
 - real time absolute flow
 - relative flow
 - real time relative flow
- 2) Kaplan Turbine Greaseless bearings:
Design, Procure, Install and Test a single Kaplan Turbine runner with grease less bearings installed on the runner blade operating mechanism.
- 3) Powerhouse Optimization: Improve analog inputs to data acquisition systems on both the turbine unit level and powerhouse level. Develop unit and powerhouse optimization algorithms and field test.
- 4) Kaplan Turbine Design Improvements
 - improved draft tube designs/modifications
 - stay vane to wicket gate alignments
 - intake modifications
- 5) Kaplan Turbine Surface Roughness effects: Investigate and quantify the effects of surface roughness improvements on turbine metal wetted surfaces.
- 6) Governor 3-D cam design improvements: Develop a design replacing obsolete equipment which is compatible with modern control systems and can be accessed and monitored from a remote location.

Benefits of Project (either Achieved or Expected):

Improved efficiency and energy production.

Status of Project:

The above projects are in process

Organizations/Companies Involved:

USACE, BPA

Funding Details (amount, funding agencies):

Directly funded by Bonneville Power Administration

Contact Information for Details on This Project:

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