

Date: March 17, 2022
To: Matthew Millar,
From: Alex Love, Director, Hydro Operations
Copy: Stuart Robinson, Hydro Maintenance Planner
Re: Taltson Hydro – Water Flow Expectations

Matt, you had inquired whether there would be any changes in water flows because of installing the new turbine at Taltson Hydro.

The Northwest Territories Power Corporation (NTPC) will be undertaking an overhaul of the Taltson generating facility. As part of the Overhaul a new runner has been manufactured for installation during the 2023 shutdown. This runner is designed to operate over a greater range than the existing runner. This means there will be similar flows over the usual operating range and the new runner will be capable of extended operation up to 22 MW with an increase in water flow (see chart).

The incremental increase in flow that may be seen in the future would be approximately an additional 18 m³/s (87 m³/s up from the existing peak of 69 m³/s). Note that the water flow, is determined by the actual system load. Since Pine Point mine closed, the usual loads vary in the 5 to 13 MW range (20 to 50 m³/s).

At rated head and peak output, the new turbine has an efficiency improvement of about 7%.

$$\text{Existing turbine runner: } \frac{69 \text{ cms}}{18 \text{ MW}} = 4.14 \text{ cms/MW}$$

$$\text{New turbine runner: } \frac{87 \text{ cms}}{21 \text{ MW}} = 3.83 \text{ cms/MW}$$

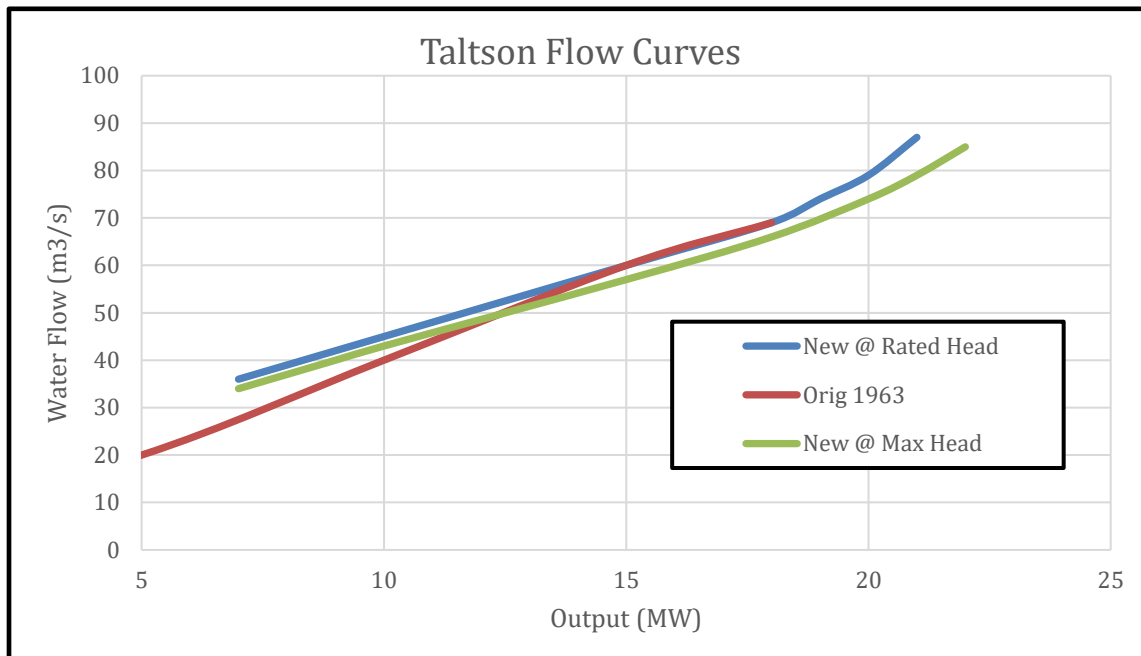
The net flow through and around the Taltson will not change. This is because any water not running through the plant goes over the free-flowing South Valley spillway and the two flows recombine downstream of the Taltson plant.

NTPC does not plan to revise any operating parameters or procedures as a result of the Overhaul. In particular, the dewatering pulse flow procedure that has been shared with the MVLWB will not change.

In summary,

- Over the current usual operating range, the water flows through the new turbine will be similar to the existing turbine.
- There is the future ability to support greater hydro-electric loads with greater water flows, likely to a similar level as was used when the Osberger units were operational.
- We do not anticipate any change to the dewatering pulse flow for fish.

Comparison of Existing and Expected new unit flow curves



Note the new unit expected performance curves are from a 2020 engineering estimate by the manufacturer.