

(a) Morris – Replace Turbine Runner Seals

Cost: \$107,000

Description: Replace the mild carbon steel turbine runner stationary seals with either Type 410 stainless steel or ASTM B271 centrifugally cast nickel-aluminum-bronze alloy stationary seals.

Operating Experience: The Morris turbine was installed as a new plant in 1983 by Barber Hydraulic Turbines. The turbine is a horizontal Francis Turbine. In April 2000, operators started to experience problems with the wicket gate operating ring jamming and acting sluggishly. The turbine was inspected and it was found that the carbon steel stationary seals had corroded, rust had accumulated, the two ends of the wicket gates were getting jammed in between the two stationary seals and the seals were in need of replacement.

Justification: Normal production at the Morris plant is 7.2 GWh of energy annually. The turbine runner stationary seals are critical to the operation of the plant. Therefore, to ensure the reliable production of energy from this facility, the equipment must be replaced. See Attachment B, *Morris Plant Turbine & Stationary Seal Inspection*.

(d) Rattling Brook – Rewind Generator G1

Cost: \$407,000

Description: Replace the stator coils in generating unit G1. This involves the disassembly of the generator, the removal of the stator winding, < > fabrication of a complete set of new coils and winding kit by a supplier, and shipped to site for installation.

Operating Experience: In 2002 the generator winding in unit G2 failed during a full load rejection. Testing revealed that a turn-to-turn fault had developed in the windings and a complete rewind of the stator was required. Unit G1 is identical in construction to unit G2, and over its forty-five year life has been exposed to a similar operating environment. Concern exists for the condition of generator windings on generators such as G1 that have exceeded their estimated life expectancy as established by the Institute of Electrical and Electronic Engineers (IEEE).