

Palisades Turbine Rehabilitation and Runner Replacement

This project will rehabilitate the turbines and replace the turbine runners on the four units at the Palisades powerhouse. The original Palisades turbine runners have been in service since 1957 and have experienced a 1.6% decrease in efficiency. Eighty percent of similarly aged turbine runners have been retired from service, meaning that they were refurbished, they failed or were removed from service to avoid failure. The Palisades units currently have a large “rough zone” between 8 MW and 22 MW. A rough zone is an interval where the turbine experiences vibration which precludes its operation within that zone. While always present, the problem is magnified during the non-irrigation season, when there is less head. As a result, winter operation at Palisades is inefficient. The minimum winter flow requirement from October to April in combination with the rough zone requires the operation of two units at low efficiency, significantly decreasing potential power generation. A new runner design will eliminate the need to operate two units at low efficiency during low flow months and allow one unit to run at much higher efficiency. A modern runner design is estimated to provide a best efficiency of 94.5% with increased efficiency gains over a wide head and flow range. This would provide a best efficiency increase of 3.8% and even higher efficiency increases at lower flow rates. Additionally, much of the annual maintenance outage time currently attributed to draft tube and runner cavitation repair will be significantly reduced after the rehabilitation and runner replacements are complete. The new stainless steel runners will be much more resistant to cavitation damage.

Based on the current project schedule, the project is expected to be completed by November 30, 2015. Project cost estimates are business sensitive information and cannot be disclosed until the competitive solicitation, evaluation, negotiation and vendor contract award is completed.