
Effect of Guide Vane Opening on Francis Turbine Noise

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Abstract:

Francis turbine is a mixed flow type turbine and produces a lot of noise during operation. The present work investigates the effect of guide vane opening and load variation on Francis turbine noise with and without enclosure. The sound level meter is used to measure the noise level around the turbine at five different locations.

During measurement the pressure head is kept 12 feet and vane opening varies from 0 %, 50 % and 100 %. The results show that the sound pressure level increases with increase in load with and without enclosure. The maximum sound pressure level at all the guide vane opening positions occurs at location B which is 0.5 meter away in front of the turbine boundary. At 8 Kg load, enclosure reduces maximum SPL by 2.1 % at 0 % guide vane opening followed by 1.5 % and 1.25 % at 50 % and 100 % guide vane opening respectively.

Keywords: *Sound pressure level, sound level meter, Francis turbine, guide vane opening, enclosure.*