

## Modelling the Effect of Head and Bucket Splitter Angle on the Power Output of a Pelton Turbine

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**Abstract :** This work investigates the effect of head and bucket splitter angle on the power output of a pelton turbine (water turbine), so as to boost the efficiency of Hydro-electric power generation systems. A simulation program was developed using MatLab to depict the force generated by the bucket as the water jet strikes the existing splitter angle (100 to 150) and predicted (10 to 250) splitter angles. Result shows that in addition to the existing splitter angle, six more angles have been investigated for the two operating conditions to give maximum power. The angles are 250, 60 and 190 for high head and low flow with increased pressure while low head and high flow with decreased pressure are 230, 210 and 30 in order of the maximum generating power. The Turbine power output for simulation was more than that of the experiment. This was as a result of their head conditions and the bucket splitter angle.

**Keywords :** bucket splitter angle, force, head, modelling, pelton turbine, power output, shaft output

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