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Study of sediment erosion in hydraulic turbine using rotating disc apparatus

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Abstract:

There are huge potential for hydropower development in Himalayan region in general and Nepal is particular. However, there are also technical challenges for hydropower development due to sediment erosion problem. Erosion not only reduces efficiency and life of hydropower turbines but also causes problems in operation and maintenance. A large number of factors can influence the process of sediment erosion damage in hydro turbine components. The erosion intensity depends on the sediment types and their characteristics (shape, size, quantities etc.), hydraulic design and operating conditions of turbine (flow rate, head, rotational speed, velocity, acceleration, turbulence, impingement angle etc.), and material used for the turbine components. In this paper, laboratory studies of particle size effect on erosion prediction in a Rotating Disk Apparatus (RDA), is briefly discussed. It is found that the intensity of erosion (weight loss) has directly proportional relation with sediment size and also erosion is directly proportional with run time when all other variables are kept constant. The results may be used for sediment erosion prediction and prevention.

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