ABSTRACT

The existence of the waterfall in Indonesia has a potential to develop and to fulfill the electricity demand in Indonesia. By utilizing mechanical flow energy of the waterfall, it will be able to generate electricity. Analysis of mechanical energy can be done by simulating using Smoothed Particle Hydrodynamics (SPH). SPH method is suitable to simulate the flow of the waterfall, because it has an advantage that can form of particles movement that falsify the characteristics of the fluid.

In this final project proposal, the SPH method is used to solve the *Navier-Stokes* equations and the continuity equation which is the core of fluid motion. The governing equations are used to obtain the acceleration, velocity, density, and the position of the particle as well as the completion of *Euler* time-stepping method. With these equations, simulating a waterfall flow generated will be more attractive and able to complete the analysis desired. Mechanical energy that generated from the flow of the waterfall is calculated based on the mass, altitude, and velocity of every particle SPH.

Keywords: smoothed particle hydrodynamics, waterfall simulation, mechanical energy