KINEMATIC ANALYSIS TO PREDICT THE PIT WALL FAILURE AT BATU HIJAU MINE – PT NEWMONT NUSA TENGGARA

Luthfan Harisan Jihadi[1], Yan Adriansyah[2] and Zufialdi Zakaria[1]

[1]*Universitas Padjadjaran, Jalan Raya Bandung-Sumedang KM 21, 45363, Bandung, Indonesia*
[2]*Newmont Nusa Tenggara, Jalan Sriwijaya no. 258, 83126, Mataram, Indonesia*
Email: luthfan.2005@gmail.com

Abstract

Batu Hijau Mine is one of the biggest open pit gold-copper mine which is located in Southern Sumbawa Island, West Nusa Tenggara Province. Based on the historical data during the mining development, the pit wall failure event at Batu Hijau is very intense due to the existence of complex geological structure and high groundwater pressure behind the wall. The study was focused to identify the possible of pit wall failure occurrence in line with the wall excavation. Geologically, Batu Hijau has heavily altered silica-rich igneous rock with very complex geological structures as its main composition. From the intact rock perspective, commonly, the igneous rock has a high value of cohesion and/or friction angle, but the pit wall failure still occurs at Batu Hijau Mine. Therefore, this study uses the assumption that the failure is mainly controlled by its geological structures. Kinematic analysis is conducted to understand the general condition of geological structure also to determine the failure mechanism. By using the Dips Software, the kinematic model of failures can be performed. Based on the result of the study, the ratio of intersected plane at critical zone and total number of discontinuity represents the significant discontinuity to the potential of pit wall failure. In addition, the kinematic analysis that conducted in this study is useful to assess the failure mechanism that may happen.

Keywords *: Batu Hijau, Slope Failure, Kinematic Analysis*