ABSTRACT

PT Newmont Nusa Tenggara is a copper mining company located in Sekongkang district, West Sumbawa regency, West Nusa Tenggara (NTB) province. A mining system used by PT Newmont Nusa Tenggara is surface mining and a method used is open pit. The research is focused on mine slopes that have experienced failure, namely Failure #79 (F#79) which is located in the north open pit. The issues which will be discussed are what the proper design of the slope height and angle in order to reach safety and speed of slope movement categorized not safe to be mined around failure F#79. The slope instability at F#79 was monitored using monitoring radar. This research aims to determine the factors that cause slope instability at PT Newmont Nusa Tenggara, a new slope design corresponding with the given factor of safety, the approximate speed and acceleration of the slope movement versus time starting from its acceleration (onset of failure) towards the slope failure at Failure F#79.

The solution to the problem is to redesign the previous slope geometry starting with back analysis to obtain cohesion (c) and internal friction angle (ϕ) using bishop method and Hoek and Brown failure criterion in the geometry before its failure. The result of back analysis shows that rocks at failure F#79 have cohesion and internal friction angle 0,255 and 14,49 (RMR 20), 0.335 and 17,40 (RMR 30), 0,515 and 23,25 (RMR 40). Slope geometry is redesigned by changing single slope angles into 65^0 and 60^0. The safe slope geometry according to the minimum factor of safety is single slope angle of 60^0, height of 15 m, and width of 10m. The mine slope instability at PT Newmont Nusa Tenggara is analyzed using MSR (Movement and Surveying Radar) data by correlating the speed of slope movement versus time.

From the analysis, it shows that the slope failure type which occurred at Failure F#79 is plane failure. The slope Instability is caused by the characteristics of the rock having very low RMR, the existing of many discontinuities in the form of faults, and high intensity of rainfall.