ABSTRACT

The growth of infrastructure development in 2004-2009 period increased by 9.44% including residential construction market (International Agency for Research WMI, 2010) that will cause cement demand will be high. This is an opportunity and a challenge for cement producers. PT. Holcim Indonesia is the third biggest cement producer in Indonesia. Cement production process requires systems that are always prosecuted in good condition, one kind of that system is screw compressor system that is being a concequency system for a whole production system in PT. Holcim Indonesia . If the screw compressor system failed, it will disrupt the whole system in PT. Holcim (will be down/stop) and it will cause Potencial Loss Revenue Rp. 50.000.000 per hour in down system (Resource: El Darud, Supervisor of Dept. Plant and Water System PT.Holcim Indonesia,2011). In addition, there should be calculated the optimal number of maintenance crew by using contuous time markov chain (CTMC) by increasing availability value of redundant screw compressor system to determine the optimal number of maintenance crew.

Plotting the distribution and determination of the distribution representing will be done based on the data TTF, TTR, and DT in 2010. Then, processing data of simultaneous differencial equation by using Transition Matrix of screw compressor system using CTMC method and Matlab to get the state probability value and optimal availability of screw compressor system.

Based on continuous time markov chain calculations, the optimal number of maintenance crew is 12 persons, it means that 6 persons are added. On this optimal number of maintenance crew, the optimal availability value of redundant screw compressor system is 97,13%. Based on continuous time markov chain calculations and data cultivations,by adding 6 maintenance crew, the total of potential loss revenue and net profit optimal is Rp 12.570.600.000 and Rp 2.682.720.000 .

Keywords: Maintenance Management, Optimization, Maintenance Crew, CTMC