The use of life cycle cost analysis to determine the most effective cost of installation 500 kV of Java-Sumatra power interconnection system

Herry **NUGRAHA** (1)(2), Zivion **SILALAHI** (1)(2), Ngapuli **SINISUKA** (2)

1 PLN Indonesia, Jakarta, Indonesia,
zivionsilalahi@yahoo.com , herry.nugraha@gmail.com
2 School of Electrical Engineering and Informatics - Bandung Institute of Technology, Bandung, Indonesia,
n_sinisuka@yahoo.com

In order to transfer 3,000 MW capacity of the electricity from the Mine-Mouth Coal-fired Power Plants in South Sumatra to the load center in Java, PLN Indonesia intends to build the Java-Sumatra Power Interconnection System. The scopes of these Power Interconnection System works are including: 34 km HVAC 500 kV Transmission Line in Java, 254 km HVAC 500 kV Transmission Line in Sumatra, 110 km HVDC 500 kV Transmission Line in Java, 354 km HVDC 500 kV Transmission Line in Sumatra, and 40 km 500 kV HVDC single core submarine cables from Java to Sumatera. This paper will analyze the financial feasibility study to ensure if the project has economic benefit, and the asset would be used effectively and efficiently along its benefit period using Life Cycle Cost Analysis (LCCA). There are several alternatives could be done in the building process, in terms of building stage and time schedule. In this paper, a LCCA will be simulated to analyze three alternatives based on financial aspects, reliability aspects, as well as load demand characteristics. As the output of this paper, the decision will be made about which alternative is the most profitable. Cash Flow and Monte Carlo simulations for a period of 30 years operation of the Interconnection System are part of the LCC models to achieve the objectives of this paper.

Keywords - Life Cycle Cost Analysis, LCCA, Java-Sumatra 500 kV Power Transmission Submarine Cables, Monte Carlo.