

Maintenance decision models for Java-Bali 150 kv power transmission sub marine cable using RAMS

Zivion **SILALAH**I (1)(2), Herry **NUGRAHA** (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

Since assets have a long operational life in electrical power system, it requires efficient maintenance planning to perform effectively throughout its life cycle to meet its operation goals. The application of Reliability, Availability, Maintainability and Safety (RAMS) analysis is currently developing in the field of electrical power system. The focus of this paper is to demonstrate the applicability of RAMS to analyze a maintenance planning on the operation of 150 kV submarine cables in Java-Bali 150 kV Sub Marine Power Transmission system in Indonesia. This system is built for interconnecting Java and Bali system through four HV transmission lines from Gilimanuk to Banyuwangi, combined of 150 kV overhead line and 4.8 km sub marine AC cable under Bali Strait. The paper will present approaches and models for estimating RAMS targets based on the service quality requirements of the power system in accordance with load forecasting demand. A model will be developed to achieve the RAMS target in maintenance strategy by choosing an effective maintenance interval and detection probability respectively. This will be illustrated by a case study on the maintenance strategy for Java-Bali 500 kV Submarine Power Transmission cables. In order to determine the cost-effective solution, LCC should be used. The maintenance strategy with lowest LCC will be the cost effective maintenance strategy. Monte Carlo simulations will be used to develop models to achieve the objectives of this paper.

Keywords - Maintenance Decision Models, RAMS, 150kV Power Transmission Submarine, Risk Analysis, Cost Effective Maintenance Strategy, Monte Carlo.