

Thesis Title Generator Maintenance Scheduling for Hydro Power System
Author Mr. Phoummy Netibanedith
Degree Master of Engineering (Electrical Engineering)
Thesis Advisor Assoc. Prof. Dr. Worawit Tayati

ABSTRACT

Hydro power stations are installed in almost all power system. In the power system with hydro power station the operation planners are concerned with the hydro station characteristics. Practically, some are neglected in maintenance scheduling problem because they are not the major constraints in most systems. However, the pure or dominant hydro system, the problem is different. Neglecting some hydro characteristics may result in an inappropriate plan. This paper proposes an integrated maintenance scheduling and production planning algorithm for generator maintenance scheduling of a hydropower system. All hydropower characteristics and constraints are taken into account in maintenance scheduling problem. The studied power system is connected with its neighboring systems for power exchanges. The objective of this method is to optimize water value or revenue of the hydro power system with standard reliability constraints. The maximum and minimum reservoir operating curves are first determined from hydrological statistics. Then the limited energy of each sub-period is calculated. After that a three step search is used to find the maximum revenue maintenance schedule. The water value is evaluated according to import and export tariffs. The maximum and minimum reservoir operating curves, the general maintenance constraints and the minimum reliability level are taken into consideration. Based on the proposed method, a computer program is developed and tested with a case study, an existing Electricité du Laos (EDL) Region I hydro power system. The results confirm the proposed method gives a better maintenance schedule compared with the maintenance schedule employed by EDL. The system revenue increase of up to 20 % is achieved while the reliability is still within EDL standard.

