

主 論 文 要 旨

論文題名

Study on reliability improvement of feasibility assessment for pumped storage power plant development by international cooperation

氏名 やまおか さとし
Yamaoka Satoshi

主論文要旨

The study was undertaken to improve the reliability of feasibility assessment for pumped storage power plant (PS) development by means of international cooperation. A feasibility study (FS) to assess PS development is commonly executed to solve fundamental issues except normal design procedure. The solution was proposed to the issues extracted from the experience of investigation or design for Upper Cisokan PS and the record of large hydropower plant construction, and operation and maintenance in Indonesia.

Critical issues have been discussed globally for PS development or dams such as identification of PS values including ancillary services, and risk management of dam safety or assessment of balance between dam construction and environment impacts. The feasibility is commonly assessed in terms of economy, technology and environment impact. The issues will change as time goes by. FS is normally executed in a conventional way without identifying issues at the initial stage. The issue oriented approach will make FS execution more effectively and efficiently.

A method of economic analysis was proposed in series from prediction of future peak load and a daily load curve to application of the least cost power plant development and load dispatch simulation. The method is proved to evaluate not only energy trade value but also some ancillary services.

Such risks of dam safety were extracted as geology, earthquake, flood and sedimentation in relation of unusual or extreme conditions. Technical solutions for issues caused from the above risks were proposed and minimum technical requirement at the stage of FS was also considered.

It has been concerned on environmental impacts of large infrastructure development globally. Environmental impact assessment tends to be applied at the stage of FS and becomes one of critical factor for a project feasibility. The solutions for issues including critical issue of involuntary resettlement were proposed

The integrated solution was finally considered on individual issue and solution mentioned above. The study results are expected to be applied to FS for PS globally under planning.