

Bibliography on the Electrical Aspects of Small Hydro Power Plants

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Abstract: This bibliography is designed to help the reader search for information on some of the electrical aspects of small hydro power plants. The bibliography is intended to help engineers and scientists who may be unfamiliar with this aspect of small hydro, university researchers who are interested in this field, manufacturers who want to learn more about these topics and librarians who provide information to their clients. Topics covered range from the small hydro economic analysis, control and governors, some aspects of hydropower development projects, modeling and simulation studies and future role of small hydro power plants. The references appearing throughout this bibliography do not represent all available material on a specific topic. The inclusion of references in the bibliography is based on several factors, including relevancy to the particular topic, frequency of citation in the professional literature and availability.

Index Terms: Small Hydro power plants, control systems, controllers, governors, turbines, speed sensing.

I. INTRODUCTION

There is a worldwide shift towards developing renewable energy resources to meet burgeoning energy demands without overlooking environment concerns. Hydropower has emerged as a major renewable energy resource today. The biggest technical merit of hydropower is that it lends reliability and stability to the power system, especially in the matter of extending peaking support. Hydropower is inexhaustible, non-inflationary and pollution free. It is therefore imperative to switch over from fossil fuel based energy to clean hydropower. In the early phases of development of power sector, hydropower played a significant role.

Small-scale hydroelectric stations are often situated in remote communities, particularly in developing countries. They are generally isolated from grid networks and therefore they require a governor to maintain the frequency at an acceptable level for the users. In an electric power system, the consumers require power at rated frequency and voltage. The maintenance of these parameters at rated values are necessary for having high efficiency, maximum life and minimum wear and tear of the consumers equipment. To maintain these parameters within the prescribed limits controls are required on the system. The voltage is maintained by control of excitation of generator and frequency is maintained by eliminating mismatch between generation and load demand. Also, a fact, which is unfortunately true, is that as the kilowatt rating of a hydroelectric plant decreases, the cost per kilowatt increases. This paper presents an extended bibliography on electrical / control systems for small hydro power stations. References in the paper have been sub grouped as follows:

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V. CONCLUSION

Although the authors have tried to sincerely present the most comprehensive set of references on the subject of control systems for small power hydro plants, the presence of omissions is bound to be there. The authors would like to apologise for any errors or omissions and hope that additional references will be advanced as discussion to this publication.

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