

CHIEF HYDRAULIC ENGINEER'S REPORT.

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Dear Sir, Complying with your instructions requesting a brief statement covering the engineering and economic conditions that obtain with reference to our plant at Niagara Falls, Ontario, I beg leave to submit the following:

GENERAL STATEMENT.

Water power as applied to mechanical or electrical transmission is valuable in degree as fundamental elements are reliable and economical. For reliability, water power must first be possessed of soundness of foundations upon which to build structures. Secondly, reliability must depend upon the question of water supply. In a third sense, this question should be discussed upon the reliability of the design that is to occupy the foundations and that is to use the water. A succeeding important element that must necessarily be discussed is the cost of operation of the plant and its intelligent upkeep.

The foregoing four elements may be regarded as of fundamental importance in the selection of a site for a water power, and as success is attained in fulfilling the requirements of the foregoing four principles, the element of economy is in relative degree obtained.

Upon the question of economy, it should be accepted as fundamental in any industrial enterprise, that the undertaking must be so founded as to be able to show profit under the most severe demands of competition. If the enterprise is installed with the foregoing capacity, it becomes as such a dominant factor in the field of competition and is qualified thereby to, in a large measure, regulate prices and the field of territory which it will occupy, and so produce satisfactory dividend returns.

SELECTION OF SITE.

The selection of the site was attended by a careful study of the conditions that have obtained for the last six years in heavy water power installations, and particular study has been given to the present plants now in operation and under way both on the American and Canadian shores, both above and below the falls at Niagara. The installations of the Niagara Falls Power Company on the American side have been on a large scale, and the demonstrations made by the foregoing company have been of particular value in the selection of your site.

The construction of a deep vertical wheel pit and the discharge of the water therefrom by the use of a low level tail race tunnel have been demonstrated as successful designs applicable to the geological conditions that exist at Niagara.

It is admitted by all that enterprises of the magnitude here under consideration cannot be so designed that the completed result is an absolute and entire success, and the Engineering Department of your company do not promise that the finished plant constructed upon the lines now laid down, will reach perfection, but rather that infirmities developed in previous similar work will be corrected. That the plant, as located and designed, will be a better plant than has hitherto been constructed is a result that the stockholders should be safely justified in expecting.

In the selection of the site chosen, special weight was given to the fact that the low-level tail race tunnel and the wheel pit on the American side have proved an entire success, as far as feasibility and permanence of construction apply.