Introduction

Itaipu is currently the world’s largest generator of renewable energy, with installed capacity of 20 generating units of 7,200 MW each (34,000 MW). The production of the Plant began in 1984 and since then has been presenting exceptional rates of power generation and very low failure rates in its equipment.

The Plant is considered one of the most efficient electrical plants in the world, with high technical performance, due to the use of advanced equipment, maintenance and implementation of the best practices and modern methods. Over the years, Itaipu has been able to minimize the time of outages of its equipment and reduce the number of failures.

Itaipu offers a great advantage when compared to other hydroelectric plants, with very low failure rates in its equipment.

In order to evaluate the existing cabling, a number of factors that influence cable service life have been considered, among which are electrical and mechanical stresses, chemical attack, thermal fatigue and environmental contamination.

The evaluation of the existing cabling was carried out in accordance with the technical standards currently in force and applicable for each test. Considering the most critical conditions imposed on the cables, such as: high mechanical stresses, humid environments, power and control applications. The results of tests and verifications are shown in the following section.

Wiring Systems

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Results of tests and verifications

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Conclusions

The main purpose of this study is to evaluate the existing cabling of the Itaipu Power Plant, in order to determine its service life and the necessity of its replacement. The results of the tests and verifications carried out in the existing cables show that they are in good condition and can continue to be used for a long period of time.

The replacement of the existing cabling by new cables is not necessary, as the results of the tests and verifications show that the existing cables are still in good condition and can continue to be used for many more years. The only recommendation is to continue with the regular maintenance and inspection of the existing cables in order to ensure their proper functioning.

For the new generation of equipment to be replaced in Itaipu in the Technical Upgrade Stage, new technologies will be adopted, including not only cables, but also equipment comprising components and accessories. It is expected that the new generation of equipment will ensure performance at least equivalent or better than those that are currently in use.

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