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Siting & design

Kurobegawa No. 4 Power Plant, Villach, Austria

Issue

In order to minimise impacts on the natural values of the area, the Kurobegawa No. 4 Power Plant in Japan and all associated infrastructure (excluding the intake structure and the dam itself) are entirely underground.

Overview

The Kurobegawa No. 4 Power Plant lies on the Kurobe River system, within the rugged Chubu Sangaku National Park, Japan.

Kurobe Dam was completed in 1961 and commenced operation in 1964. Located 1300m above sea level in the Kurobe River Canyon, the scheme is situated in some of the most remote and inaccessible country in Japan. The site is also one of the most precipitous in the country, with average annual rain and snowfall of around 4000mm.

Construction of the Kurobe Dam was a massive joint undertaking between the Kansai Electric Power Co., Inc. and the World Bank, and was intended to meet the power demand associated with the rapid post-war economic recovery of Japan. At the time of completion, the Dam was the largest arc type dam in the world. At 186m in height it remains the largest of its kind in Japan.

Details on sustainability aspect

The Kurobe Dam and Kurobegawa No. 4 Power Plant were constructed within national park, in what was considered one of very few untouched areas of natural beauty in Japan. The Kurobe Canyon has long been considered one of the most spectacular natural beauties of the region, but its rugged nature and inclement climate rendered it inaccessible to the general public until access routes were constructed for the Kurobegawa No. 4 project. Minimisation of visual impact was a key factor in the siting and design of hydropower infrastructure.

To achieve this objective, the generation and transformer facilities (including water

channels, surge tanks, penstocks, plant buildings, transformer station, and switching station) were constructed underground and only a few facilities such as the dam body and water intake structures appear above ground.

Other Aspects

[Multiple use benefits](#)

The construction of the Kurobegawa No. 4 Power Plant has significantly improved tourist access to the Japanese Alps. Haulage roads built during the construction of the dam have become major sightseeing routes, attracting 1 million tourists annually. This has created a thriving tourist industry, including cable cars, hire boats, accommodation. The struggle to construct an access tunnel through Mounts Akazawa and Narusawa became the subject of a popular Japanese movie.

Further Information

<http://www.kepco.co.jp/english/index.html>

Source: Hydropower Good Practices Workshop, Annex VIII - Examples for Good Practice Report, Villach, Austria, October 2005. International Energy Agency.