

FOUM EL GUEISS DAM – ALGERIA

Successful delivery

On June 26, Hydroplus completed, on time and on budget, the Foum el Gueiss dam upgrade for the Algerian National Dams and Transfers Agency (ANBT), delivering this project to the client's complete satisfaction.

Works were carried out from October 2004 to May 2005. In spite of the November 2004 Mediterranean sea storm and harsh winter conditions in Algeria, which delayed shipping and casting, local teams managed to make up for lost time.

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Foum el Gueiss is a rockfill dam, 23 m in height, built in the 1930s. It features a free sill with a curvature centred on the upstream side and a walkway atop the supporting piers. The dam is located upstream Kais, 80 km east of Batna.

GHRIB DAM – ALGERIA

3rd contract for Hydroplus in Algeria

On August 21, Hydroplus signed the notification to proceed with design studies and works to raise the Ghrif dam. The €10.5 million contract covers supply and installation of 20 labyrinth Fusegates of 4.50 m high, as well as related reinforcement works. The project, to be completed in just 16 months, is the largest-ever contract for Hydroplus, which was founded in 1991.

It will increase the dam's storage capacity by 70 million m³ and almost restore the initial reservoir storage before silting up. It will significantly improve water supply in the upper Cheliff plain in the west of the country and the Mitidja plain in the east. Built in the thirties, the dam includes a very large spillway fitted with several arch walls working as energy dissipators and

a huge embankment dam separated from the spillway by a hill.

This is the third contract awarded to Hydroplus by the Algerian National Dams and Transfers Agency. The first two covered the raising of the Beni Amrane dam in 2003 and, as above, the Foum el Gueiss dam.

CONT'D – FOUM EL GUEISS

Successful delivery

Hydroplus installed 48 concrete labyrinth crest Fusegates, each 1.10 m in height, to counter silting of the reservoir up to 84% of its capacity. Installed atop a 10-cm lowered sill, the Fusegates allow for an increase in storage capacity of up to 530,000 m³, which is 111% of the dam's useful capacity. Furthermore, they guarantee sufficient allowable draft in the event of dredging with the use of a barge. The modules are designed to overturn when the upstream level in the reservoir reaches a point 0.78 m above the spillway, which corresponds approximately to an 80-year flood probability.

Prior to the upgrade, tests on scale models were performed at Sogreah's

labs in Grenoble, France, to study the spillway's discharge as a function of the reservoir silting. These studies showed that for a maximum overflow of 600 m³/s, the discharge coefficient ranges from C=1.39 to C=1.86, depending on the siltation level immediately upstream of the spillway. Silting of the reservoir hindered the dam's capacity to handle exceptional floods.

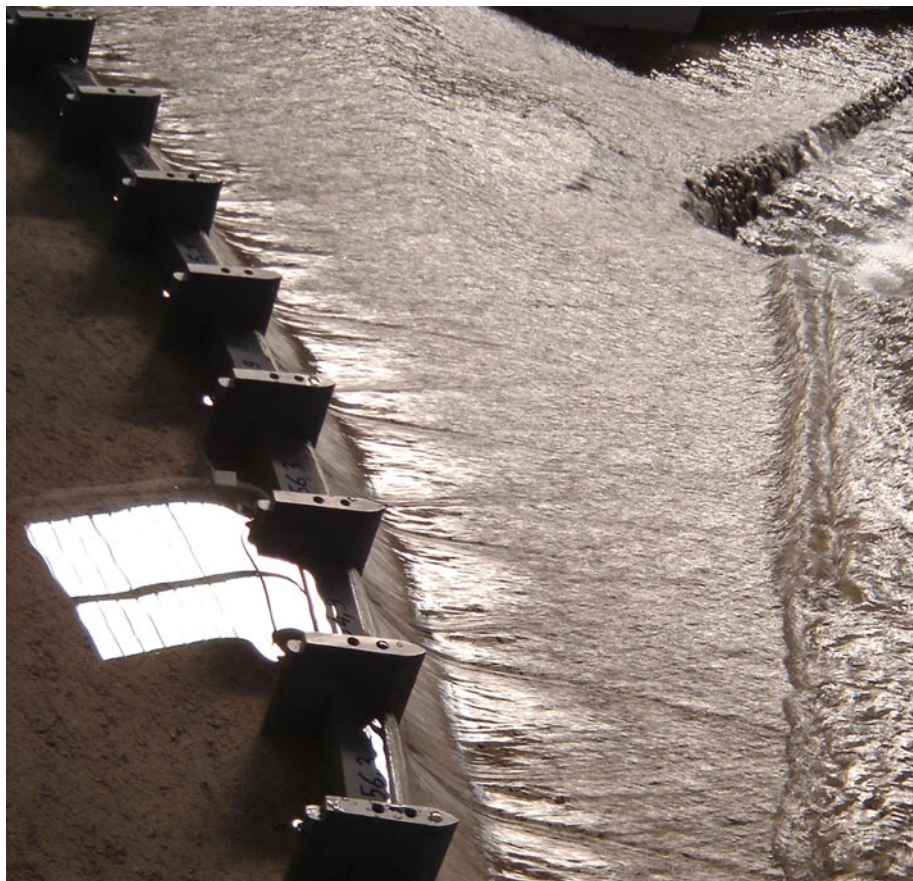
Upgrade of the dam using Fusegates restored the reservoir's initial capacity rapidly and cost-effectively, while preventing environmental problems related to the storage of silt collected during dredging operations.

Silting: the challenge facing the countries of the Maghreb

Dams in the countries of the Maghreb face dangerous silting conditions due to high levels of sediments in floodwaters. The useful capacity of reservoirs may drop by 0.5% to 1% per year, and reservoirs built before 1988 are likely to lose half of their storage capacity by 2050.

In Algeria, that figure is closer to 2 to 3%. The 50 dams operated by the ANBT have lost roughly 700 million m³ of their total potential capacity of 6.2 billion m³ due to silting. As a result, over the past few years, the ANBT has implemented large-scale dredging operations at many of its dams.

The use of Fusegates to upgrade the reservoir is a quick, cost-effective, and environment-friendly alternative to dredging. This should be accompanied by soil conservation practice in order to be efficient in the long term. In 2003, Hydroplus demonstrated the effectiveness of Fusegates for this purpose by upgrading the Beni Amrane dam, which was subject to high levels of silting (see Fusegate News, No. 3). The installation of Fusegates at Beni Amrane increased supply by 7.1 million m³ at a cost of 3 million euros, that is €0.42/m³, compared to the cost of dredging in Algeria, which ranges from €1.00 to €1.50/m³.



Tests on scale model

FASEP - THAILAND Phase 1 completed

Hydroplus, in partnership with Sogreah, has completed Phase 1 of the study sponsored by the government of France to optimize Thailand's irrigation systems for the country's Royal Irrigation Department.

Engineers have visited 20 dams to determine the potential for installing Fusegates; they also collected valuable data about hydrology and water demand. Following analysis of this information, Hydroplus and Sogreah

selected the 10 most promising dams, whose upgrade would provide additional storage of 36.5 million m³.

The Royal Irrigation Department approved this selection and launched Phase 2 of the project. Currently under way are feasibility studies of the selected dams, which include a hydrology study, the design of the Fusegate System, the overall stability of the modified dams and a cost-benefit estimate for the project.



The Huai Saphong Noi dam is one of the promising dams that could be upgraded.

Events

ICOLD CONFERENCE

Hydroplus attended the 73rd International Commission on Large Dams in Tehran, Iran, in May 2005. With 228 dams in service, 86 projects under construction and 216 projects in the design phase, Iran is one of the most active countries in water-resource development. Hydroplus has established relationships with consulting engineers in Iran and is studying the application of the Fusegate technology to a dozen dams.

HYDRO 2005

VILLACH, AUSTRIA
October 17 to 20, 2005
Booth 23

ANCOLD 2005

FREMANTLE, WEST AUSTRALIA
November 20 to 24, 2005
Booth 11

POLLUTEC 2005

PARIS, FRANCE
November 29 to December 2, 2005

CUSTOMER ORIENTATION Free preliminary study

To assess the technical feasibility of the Fusegate System on a specific project, we can carry out a preliminary study – free of charge and without any commitment on your part. For more information, please write to contact@hydroplus.com. Hydroplus engineers are always available to answer your queries.

In addition, guidelines for designers regarding the implementation of the Fusegate System will soon be available.

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