Project: HYDROMATRIX®-MODULE IN AN EXISTING DAM STRUCTURE – PART 1
PRE-TESTS ON AN EIGHT-PACK MODEL (scale 1:15)

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Client: VA TECH HYDRO GmbH & Co

Objectives: Determination of downpull forces and flow induced vibrations
Reduction of downpull and damping of possible flow induced oscillation

Abstract
The Institute of Hydraulic Engineering performed experimental pre-tests for the determination of hydrodynamic forces and flow induced vibrations on a so-called "HYDROMATRIX®-module" during different underflow conditions. It is planned to shift this mobile module in place of the stoplog slots in a tainter gate bay of an existing run-of-river project – which only currently serves water level control for navigation - to generate electrical energy. Apart from this use, the module has to fulfil also the functions of stoplogs in emergency situations. For this purpose it must be able to sink into the flood discharged bays. In order to determine the downpull forces during flood conditions, a hydraulic model was tested in a flume. Therefore a short section of the module was built to a scale of 1:15 in plexiglass which consists of 4 bulb turbine-axes in breadth and 2 turbine rows in height. The experimental pre-investigation should reveal distinct module positions in correlation to different tailwater levels which essentially influence the development of the hydrodynamic forces and module oscillations. In case of exceeding a permissible amount of the hydrodynamic forces the project would be economical inefficient due to the necessary reinforcement of the existing supporting system.

Hydraulic pre-tests on an eight-pack model

References: