Project: HEAD LOSSES ALONG A COOLING WATER TAILRACE SYSTEM (scale 1:14, 1:15.5)

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Client: VA TECH COMBINED CYCLE GmbH & Co

Objectives: Head loss calculation along an outflow section (seal pit to sea outlet) Determination of head losses on different single hydraulic structures Recommendation of constructive measures for head loss reduction

Abstract
In context with the planning of the cooling water system at a combined cycle gas turbine power station in Ireland, the Institute of Hydraulic Engineering was commissioned to determine the hydraulic head losses along the outflow section. This section contains a new seal pit, existing culverts which must interconnect, a siphon pit and the sea outlet. The main objectives of the investigation should cover the experimental determination and numerical verification of local head losses on specific structural components. The individual tests were carried out on several plexiglass models to a scale of 1:14 for a seal and a syphon pit and to a scale of 1:15.5 for a Z-shaped connection between an existing and a new culvert section. The results were used as input data for the steady calculation of the complete grade line of head losses along the outflow section to determine finally the cooling water pump heads.

Experimental and numerical investigations of hydraulic structures along a cooling water tailrace

Seal pit, scale 1:14

Syphon pit

Interconnection scale 1:15.5

Reference:
PRENNER R.: Coolkeeragh C.C.G.T. Power Station, Ireland, Head Loss Calculation and Model Tests on the Cooling Water System from Seal Pit to Sea Outlet, Seal Pit and Syphon Pit, Model - Scale 1:14, Intersection Model - Scale 1:15,5, May 2003, Final Report (unpublished)