

New Naga Hammadi Barrage and Hydropower Plant Egypt



Project Description

Between 1927 and 1930, a barrage was constructed across the Upper Nile River to provide irrigation water for the year-round cropping of some 320'000 hectares of agricultural lands along the Nile River. With the completion of the High Aswan Dam in 1963, the river regime changed and hence the flow and operating conditions. This, together with the aging of the structure raised doubts about the structural integrity of the barrage and its long-term reliability to secure the supply of irrigation water. Studies carried out by Pöyry Energy Ltd. in JV with two other Consulting Companies started in 1993. Based on the various alternatives, the studied, the Govern-

ment of Egypt decided to construct a new multi-purpose structure with a 64 MW hydropower plant and double navigation locks, and to rehabilitate the existing irrigation head-works. The Project has an investment volume of EUR 297 million financed by the KfW and EIB. Construction is scheduled to be completed by the end of 2007 with environmental monitoring continuing until 2008. The new Naga Hammadi Barrage together with the rehabilitated irrigation head-works will secure the livelihood of about 2 million people in Upper Egypt who depend on irrigated agriculture, produce annually 464 GWh of energy and increase the navigation capacity of the Nile river.

Client

Ministry of Water Resources and Irrigation
Ministry of Electricity and Energy

Project

Multipurpose project for irrigation water diversion, hydropower production and navigation

Service Provider

Pöyry Energy Ltd. in JV with two other international Consultants, and in association with two local engineers

Services

- Conceptual and Feasibility Study
- Tender design and tendering
- Hydraulic model tests
- Detail design and civil construction drawings
- Construction and installation supervision; commissioning
- Co-ordination of interfaces between contractors and suppliers
- Guidance for the implementation of the environmental management plan

Execution Period

1998–2008

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Key Data

Irrigation

Headpond level	65.9 m a.s.l.
Western NH canal	204'295 ha
Eastern NH canal	63'975 ha
Upstream by pumping	52'350 ha
Total irrigated area	320'620 ha

Navigation locks

Number of navigation locks	2
Total structure length	220 m
Usable chamber length	150 m
Net width	17 m
Depth, minimum	3 m
Maximum lift height	8.0 m
Filling / emptying time	10 min

Sluiceway

Number of gates	7
Type of gates	radial, with flap
Dimension (H x W)	13.5x17.0 m
Design flood	Q10,000 5'700 m ³ /s

Powerhouse

Power generating equipment:	
Type	bulb generator-turbine
Number of units	4
Generating capacity, total	64MW
Design discharge	4x320.0 m ³ /s
Maximum discharge	4x417.5 m ³ /s
Runner diameter	6.8 m
Rotational speed	73.2 rpm

Average annual energy production:

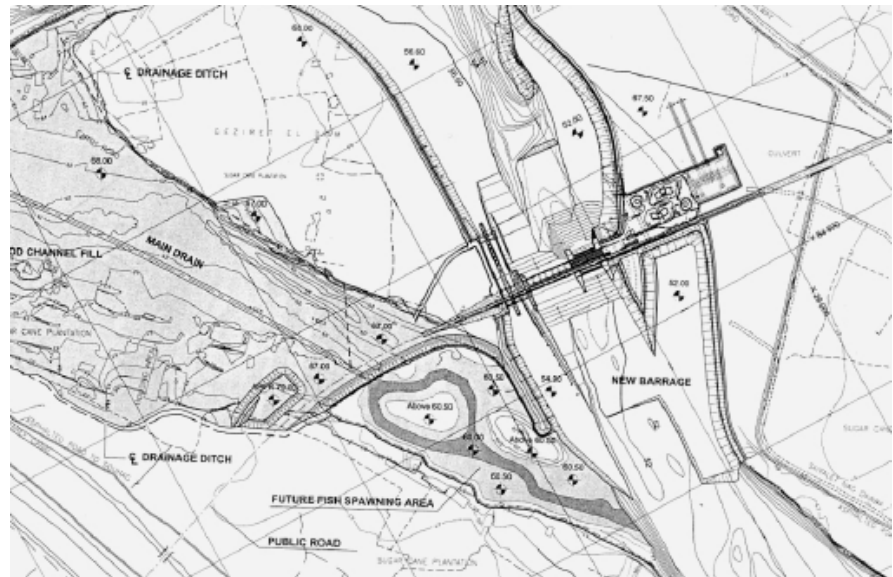
Net head (at design flow)	5.56 m
Head range	7.97 m / 2.40 m
At transformer terminal	464 GWh
Switchyard	220 kV

Transmission line

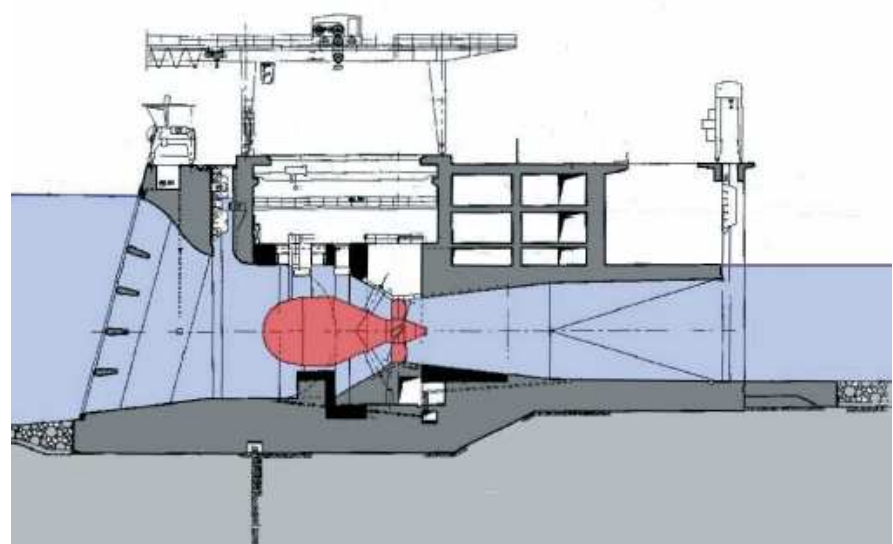
Total length	35 km
Type	Double circuit 220 kV

Environmental Data

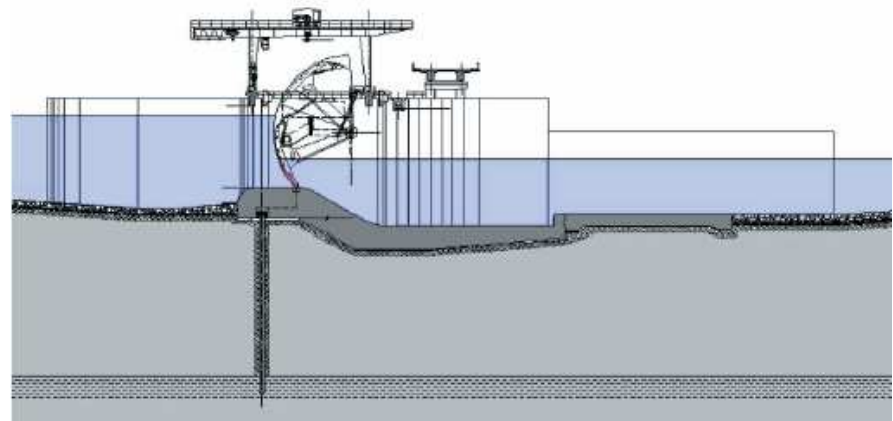
Land lost for construction	125 feddan
Land reclaimed	230 feddan
Houses and stables relocated	64
(Note: 1 feddan = 0.42 ha)	



General layout



Powerhouse cross section



Sluiceway cross section