PÖYRY PROJECT SUMMARY

Nam Theun I HPP, Lao PDR

Project Description

The 650 MW Nam Theun 1 HPP is located at Nam Kading River, approx. 33 km upstream of its confluence with the Mekong River and 270 km from Vientiane in Central Laos (Boli khamxai province).

The main structure of this project is the 177 m high curved gravity RCC dam that supports a centrally located 6 bays gated crest spillway with a conventional concrete chute and flip bucket capable to spill a flood of 23,500 m^3/s, located in a narrow gorge with reasonable geological conditions.

The powerhouse is located on an excavated platform on the left bank of the river, about 450 downstream of the dam with 3 turbine generator Francis units (2x260 MW for EGAT and 1x130 MW for EDL) located in two deep circular shafts and a pressure (tunnel/shaft) power waterway common to all three units to be driven through the left abutment of the dam from a large self-starting outdoor power intake located upstream of the dam.

The inherent advantage of this solution is because the powerhouse is separate from the dam site, it allows works to progress on various locations at the same time with far less disruption of construction works during the high water periods.

The diversion tunnel located on the right bank is designed to only pass the design floods of the Nam Kading River during the dry season while allowance is made for overtopping of the two cofferdams and the dam construction site during the high floods of the rainy season.

Client

Gamuda Berhad, Malaysia (2004 – 2006)
Phonesack Group Co. Ltd, Thailand (2013 – 2016)

Project

Nam Theun I HPP

Services

- Feasibility study
- Social and environment impact assessment study
- Basic Design
- Tender design
- Tender documents
- Pre-qualification
- Tender evaluation
- Technical support during negotiation with Contractors until contracts award
- Technical support in relation with PPA and CA negotiations until Financial Close

Execution Period

1995 – 1996	Feasibility Study
2004 – 2006	Review of feasibility study, Basic design study, Power Purchase Agreement(PPA)support
2013 – 2014	Feasibility Study
2014 – 2016	Social and environmental Impact study, Basic Design, Tender Design, Tender Documents and all kind of technical support to the Client until Financial Close

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Nam Theun I HPP

Key Data

Dam

Type	RCC curved gravity
Height above foundation	177.00 m
Crest length	771 m
Crest elevation	297.0 m a.s.l.

Reservoir

Catchment area	13,856 km^2
Mean inflow	317 m^3/s
Full supply level	292.0 m a.s.l.
Max. flood level	297 m a.s.l.
Min. operating level	250.0 m a.s.l.
Storage volume	3,009 million m^3
Live storage	2,020 million m^3
Area at full supply level	93.6 km^2

Spillway

Type	6 tainter gates
Gate dimensions	20 x 17.3 m
Design capacity	30,200 m^3/s

Low level outlets

Number of openings	1
Type of gates	2 x 2 slide gates
Service gate dimensions	3.5 x 4.7 m
Maintenance gate dimensions	3.5 x 4.9 m
Design capacity	618 m^3/s

Waterways

Water Intake

No. of intakes	1
Dimension	41.0 x 22.0 m

Pressure Tunnel

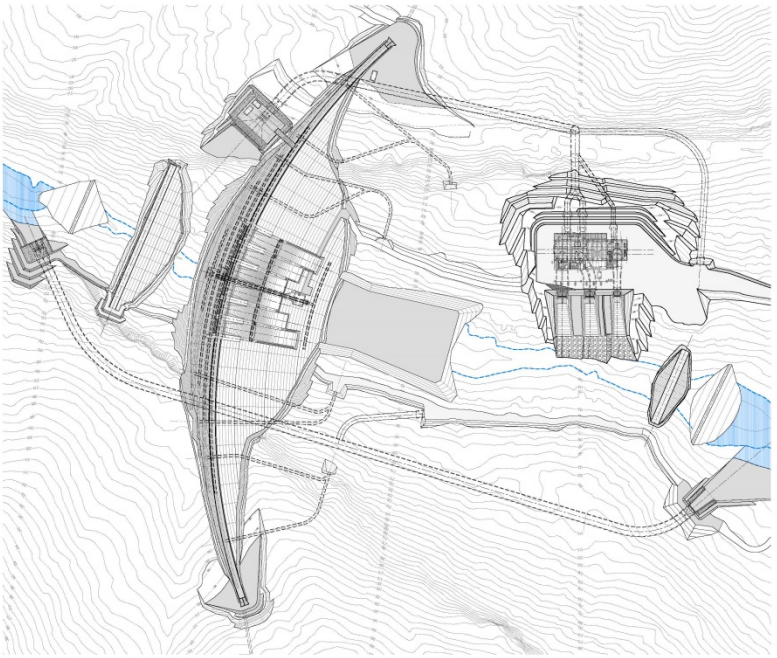
Length	550 m
Diameter	11.40 m
Design flow	514 m^3/s

Penstocks

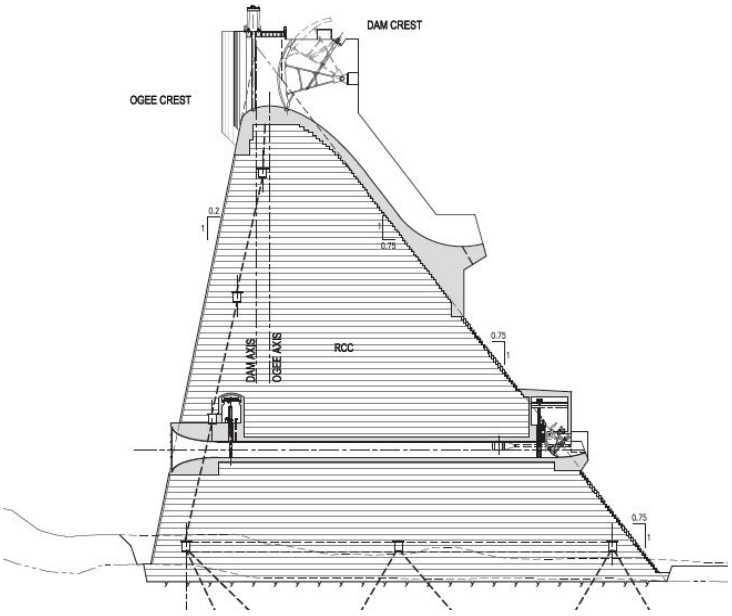
No. of penstocks	1
Diameter	10.00/6.30/4.50 m
Length	470 m

Powerhouse

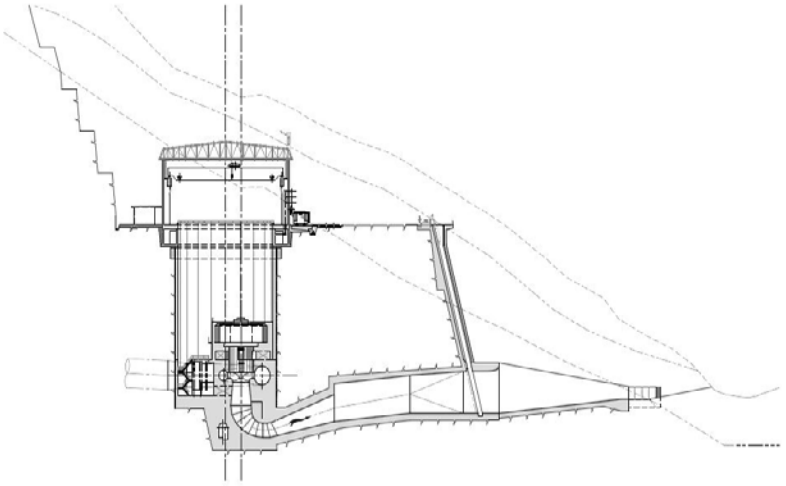
Type	Pit-Powerhouse
Gross head	145.5 m
Turbines	Francis (3 units)
Installed capacity	650 MW
Annual energy output	2,560 GWh



General Layout of NT1 HPP



Typical Cross-section of the Dam



Cross-section of the Power house

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