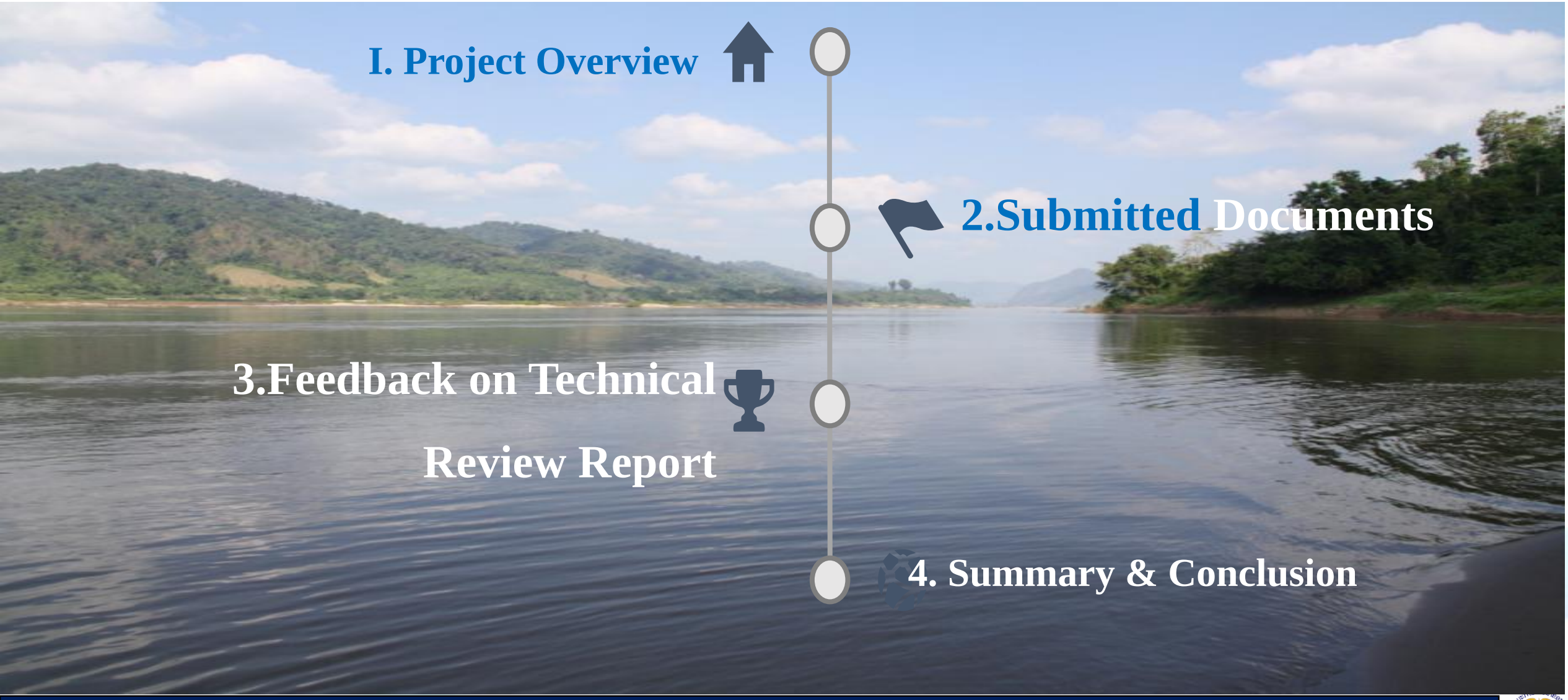
National Public Hearing on Technical Review Report for PL HPP

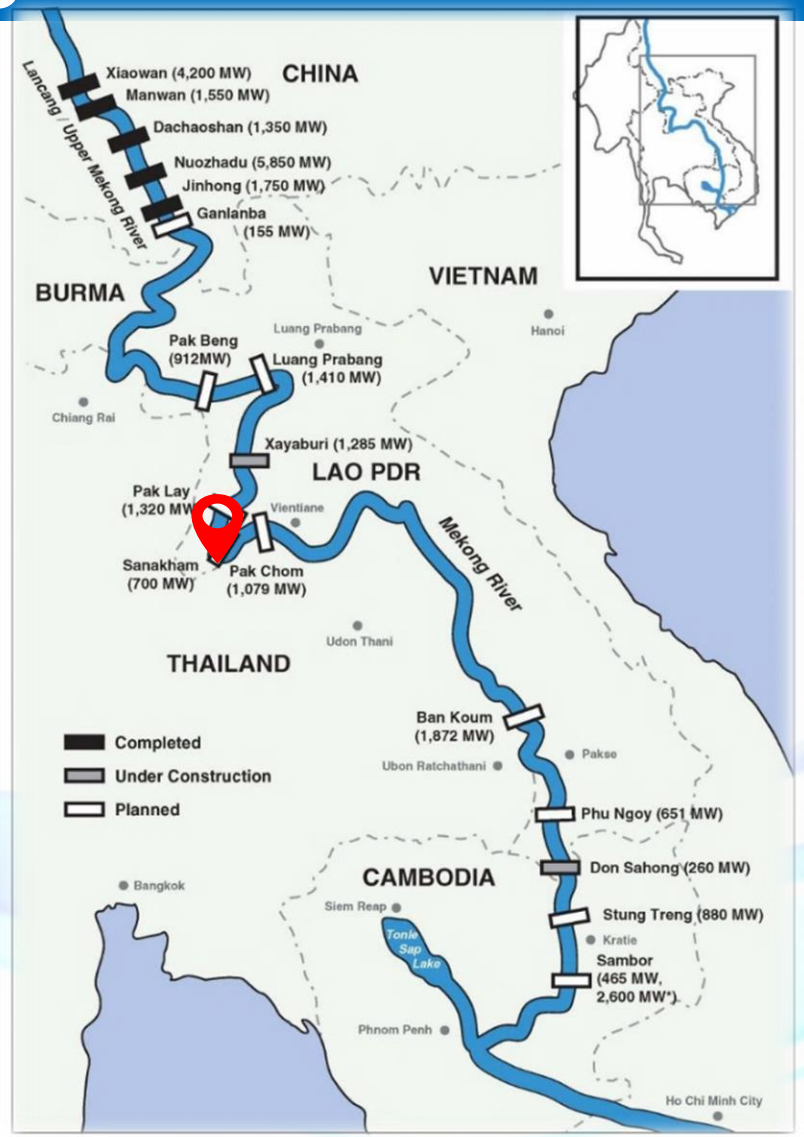
At 6th Regional Stakeholder Forum/2nd Regional Information Sharing

17th January 2019, Luang Prabang, Lao PDR

Contents



Project Location



Mekong Mainstream Project

4th of the 5 hydropower projects along the Mekong mainstream in Lao PDR upper Vientiane

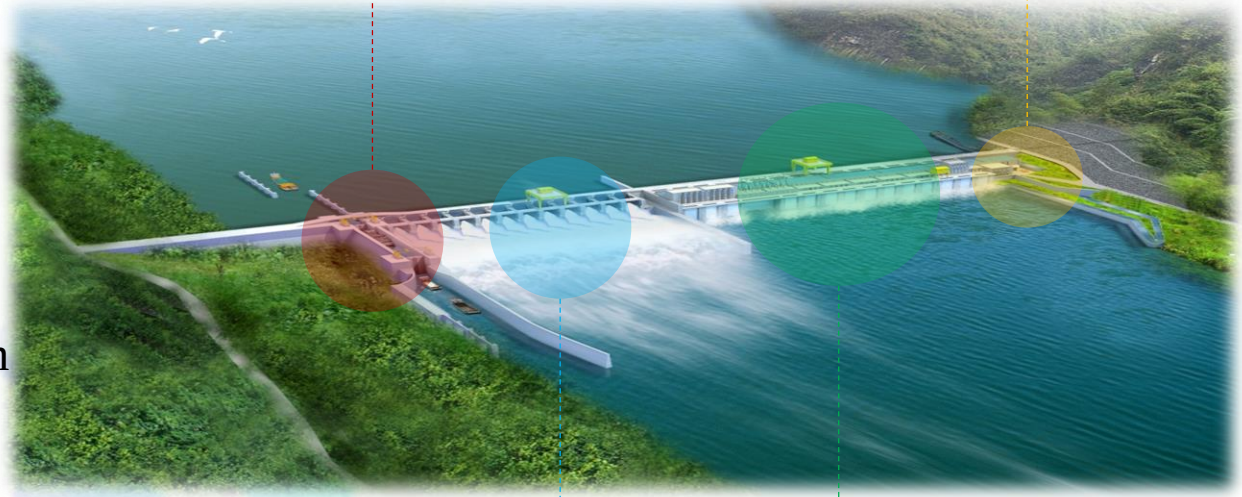
Project Location

- 241 km from Vientiane Capital
- 115 km from Xayaburi Hydropower Project
- Straight-line distance to Lao-Thai border approx. 60km

Project Structure

Navigation Locks

- Single-Stage ship lock
- Capacity for passing 500t ships
- Size of navigation lock: 120m*12m*4m



Fish Passage

- 1017m length, 6m width, 3m depth
- Width allows two-way pass.
- Large resting pool

Spillway

- EL 220m: 11 open-type high-level surface bays (16m*20m)
- EL 212m: 3 open-type low-level surface bays(16m*28m)
- EL 205m: 2 sediment flushing bottom outlets(10m*10m)

Power House

- Capacity: 770 MW
- 55 MW of bulb generating unit
- 14 Units

2. Submitted Documents

Submitted Documents (1)

1. Feasibility Study Report (**1,298 pages**)
2. Environmental and Social Impact Assessment (ESIA) Report (**1,553 pages)**
3. Review Reports of CNR (Compagnie Nationale du Rhone) & Fishing Engineering of Brazil (**244 pages)**
4. The clarification for the scoping assessment of PLHPP
5. The clarification for the comments from MRC on 1st JCWG meeting
6. Comments on the 5th Regional Stakeholder Forum

Submitted Documents (2)

7. Comments on the 1st draft TRR
8. DL5108-1999 Design Specification for Concrete Gravity Dams (Chinese-Eng translation)
9. SL319-2005 Design Standard for Concrete Gravity Dams (Chinese-Eng translation)
10. Seismic Hazard Assessment Report for PLHPP
11. Hydraulic Model Test Report of PLHPP
12. Dam Safety Evaluation and Effect of Dam Breach;


P 59
File No.: J18—2000

DL

Hydropower Industry Standards of the People's Republic of China

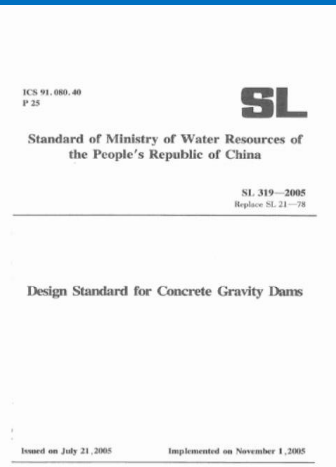
P DL 5108 — 1999

ENGLISH VERSION

Design Specification for Concrete Gravity Dams

Issue Date: Feb. 24, 2000 Implementation Date: July 1, 2000

Issued by: The State Economic and Trade Commission, P.R.China


ICS 91.080.40
P 25

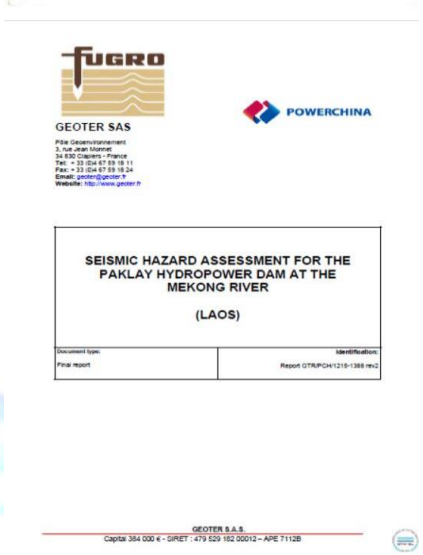
SL

Standard of Ministry of Water Resources of the People's Republic of China

SL 319—2005
Replace SL 21—78

Design Standard for Concrete Gravity Dams

Issued on July 21, 2005 Implemented on November 1, 2005


FUGRO

GEOTER SAS

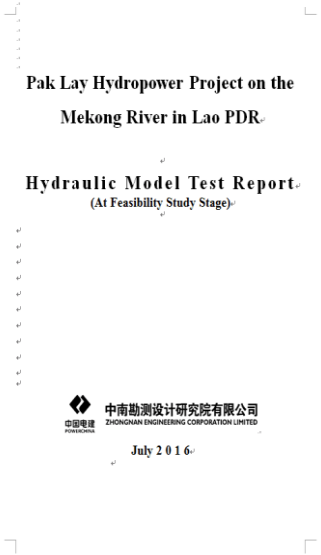
POWERCHINA

SEISMIC HAZARD ASSESSMENT FOR THE PAKLAY HYDROPOWER DAM AT THE MEKONG RIVER (LAOS)

Document type: Final report

Identification: Report GTR/PCH/1210-1388 rev2

GEOTER S.A.S.


Pak Lay Hydropower Project on the Mekong River in Lao PDR

Hydraulic Model Test Report

(At Feasibility Study Stage)

中国电建 POWERCHINA

中南勘测设计研究院有限公司 ZHONGNAN ENGINEERING CORPORATION LIMITED

July 2016

3. Project Progress

Project Progress

Feasibility Study

2007
Exploration Survey

Feb 2009
Water Level Comparison And Selection Report (Lower Dam Site, Draft)

Feb 2011
FSR（Lower Dam Site）

Mar 2011
Interim Approval (Lower Dam Site)

Oct 2012
Geological Exploration and FSR（Upper Dam Site）

Apr 2014
FSR Review by CREEI

Sep 2015
MRC Compliance Review

Oct 2015
Interim Approval (Upper Dam Site)

Jan 2017
MRC Compliance Review Report (Final)

Mar 2017
FSR (Final)

Aug 2017
Final Approval

10 years of profound study with involvement of good designing firm and international consultants, laying a solid foundation for the project implementation and operation.

Project Progress

Environmental and Social Impact Assessment

Completed and updated 9 ESIA related reports:

1. Transboundary Environmental and Social Impact Assessment (TBESIA)
2. Cumulative Impact Assessment (CIA)
3. Environmental Impact Assessment (EIA)
4. Environmental Management and Monitoring Plan (EMMP)
5. Social Impact Assessment (SIA)
6. Social Management and Monitoring Plan (SMMP)
7. Resettlement Action Plan (RAP)
8. Access Road IEE
9. Health Impact Assessment (HIA)

Project Progress

Hydrological Data Continued Collection

- The data series have been prolonged up to 2015 and further analyzed and assessed LPB (1960-2015) and CK (1967-2015)
- .The hydrologic survey at the damsite section, including the water level, discharge and sediment measurement, as well as the bed material sampling and grading analysis, has been conducted.
- The water level gauging station at the dam site was restored and manual water level were build and observed.



Site visit by MCs and MRCS on 07 Nov 2018



4. Discussion on Technical Review Report (DRAFT 2.0)

National Consultation Meeting on 21Dec2018

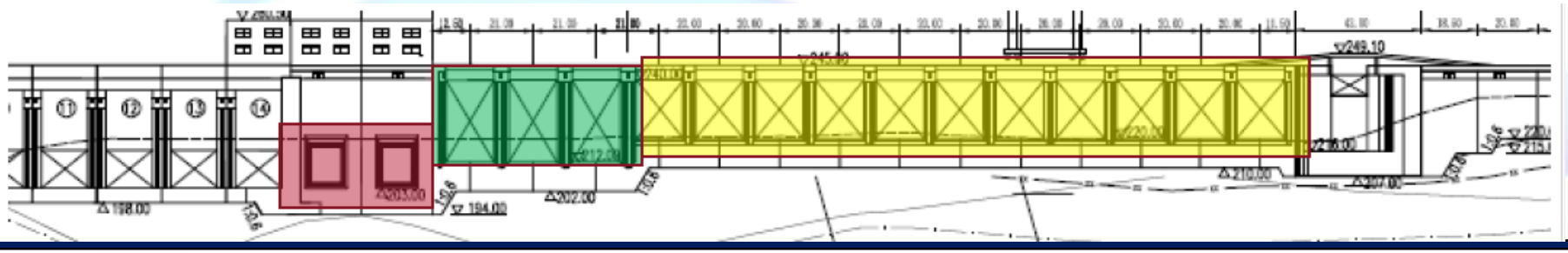
- National Technical Workshop on Technical Review Report for the Proposed Paklay Hydropower Project on 21 December 2018
- Its aimed at update progress on the PNPCA Roadmap for PL HPP and discuss the 2nd Draft Technical Review Report of the Pak Lay Hydropower Project
- Cleared explanation on design and data collection by developers
- Considered only the key policy and principal recommendations from TRR

Discussion on TRR (Hydrology)

- Consider to update data on hydrology, sediment, fish, WQ and share with MCs during detail design
- Noted that climate change impact is global issue However, Some CC data have been presented in the ESIA reports (submitted document)
- Inform that assessment of the results of the numerical and the physical model calculation are submitted;
- Will monitor the critical places of the downstream banks and take countermeasures timely when any problem is found.
- Prepare an emergency plan, establish a working coordination mechanism with the local government, will be set up when necessary
- Paklay Project has its own unique design, aanalysis will be carried out according to the arrangement in the detail design BUT not obviously follow Xayaburi design
- Plann to establish Joint Monitoring Center to manage the cascase dams in Lao PDR

Discussion on TRR (Sediment)

- All related information and data sources for sediment (as requested) will be shared and exchanged with the MRCS for further improvement
- Two low-level sand-flushing outlets provided at the dam of Pak Lay HPP, Based on hydraulic model test and sediment model calculation, sand-flushing facilities meet the requirement on sand flushing.
- Spillway designed (11 surface spillways at 220m 11 surface spillways at 220m (16*20m) + 3 middle level spillways at 212m(16*28m) +2 bottom outlets at 205m (10*10m)) to accommodate sediment transport in the river
- Detailed monitoring scheme for downstream scouring will be carried out in the next stage
- Comprehensive on-site Measurements and sediment management strategy were defined to mitigate the impacts to the largest extent



Discussion on TRR (WQ)

- Note on concern about Environmental Flow assessment, more information on Env. Flows will be provided at the detail design stage.
- Any additional request such: DRIFT tools is hard to apply due to the limited user of study, Consider DRIFT has never apply or use in any project before
- Understand that water quality data were collected based on Lao standard and plan to monitor WQ during the construction and operation phases
- Detail of monitoring and management for Social and Environmental M&M will be set up
- Committed to work further with MRCS to integrate WQ and EHM data for further investigation

Discussion on TRR (Fish and Fish Passage)

- Noted all related comment to the fish and aquatic animal as well as designed fish passage, and monitoring
- Confirm that robust fishery monitoring systems has already been considered in FS
- Data collection and fishery monitoring system are planned to be established respectively during both construction and operation period of the Project.
- An effective impact mitigation measures for fish migration and spawning is also considered during the design and operation phases.
- According to the flow characteristics of the Mekong River, it's difficult to find suitable fish screens currently

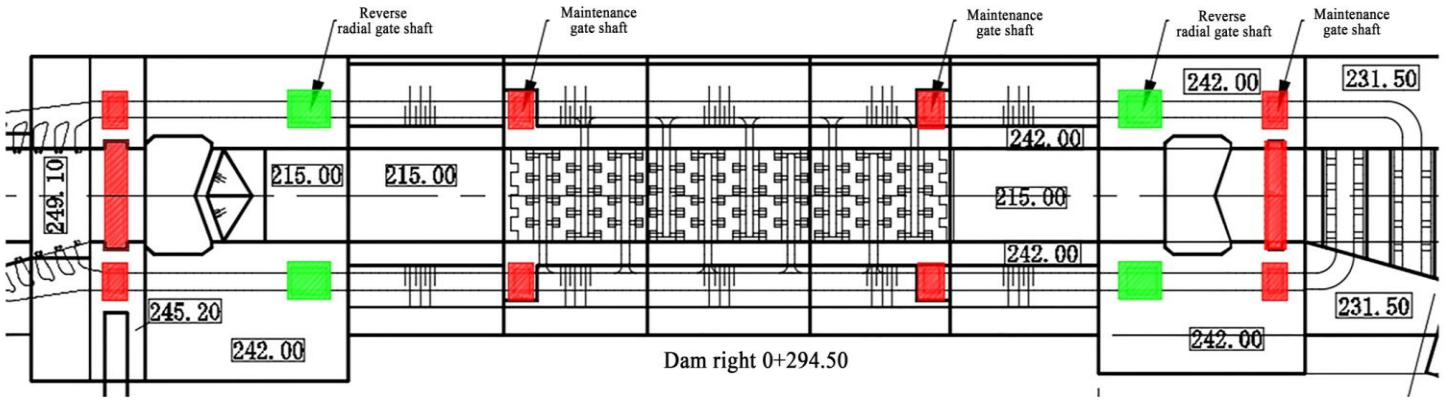




Discussion on TRR (Navigation)

- In the detailed design stage, the air clearance could be raised minimum 10m in order to meet the requirement of the height over the upper lock head.
- Excavated channel during project construction for 2nd ship lock and its drawing is available now
- Ensure that ship lock of Pak Lay HPP could enable the safe navigation of any ship that is smaller than the design ship size.
- Confirmed ship lock of Pak Lay HPP could enable the passing of 500t ship with 120m x 12m x 4m size

Ship lock Simulation Model



Discussion on TRR (Dam Safety)

- Confirmed FS were reviewed by well-known independent companies (CNR) before they were submitted to MRC for Prior Consultation Process
- The hydraulic model test and seismic hazard study reports provided to MRCS,
- Seismic assessment design for the main structures follows ICOLD criteria
- Sufficient safety margin has been considered in the design stage, and the probability of dam failure is little due to the dam structure design.
- The **concrete water-retaining** structure, water-releasing structure, water-retaining powerhouse, and upper lock head of the ship lock are designed with a design flood of 2000-year
- Dam break analysis will be carry-out in the next stage

Discussion on TRR (Socio-Economics)

- The key challenge for doing this report is about information sharing and access to the data where natural environment from Xayaburi to Mekong Delta, appreciated if MRCS can share Socio-economics data.
- In some part the information can be referred to each other since it is on the same river. The reviews should not focus on the duplication, the study has classified different zones, upstream and downstream, that were different in nature.
- Upstream information was totally different from Pak Beng due to different geographical areas. But downstream environment info was the same except social changed such as increase in number of population within the 5 km corridors.

Summary Comment

- The second draft of TRR for Paklay hydropower project had been slightly improved/changed, based on comment from Lao PDR (need improving)
- The TRR should carefully consider applying the realistic and practical activities rather than asking MCs or Developer to apply new and critical tools such: DRIFT which had never applied in MCs
- The TRR should strictly promote and apply existing MRC procedure, such as PDG 2009 to review and recommendation, rather than promoting the unapproved updated document which is still in process of discussing.

Conclusion

- Reiterate that GOL had fulfilled its obligation under the 1995 Mekong Agreement and met all MRC requirement (PDG)
- Pak Lay HPP have carried out more than 10 years of in-depth studies and involved an outstanding designing firm and international consultants,
- PL HPP reviewed by well-known independent companies before submitted to MRC for Prior Consultation Process
- Take note any advice and follow the suggestions in the spirit of cooperation for sustainable development in order to fulfill the purpose of the 1995 Mekong Agreement
- Lao Government are opened to constructive discussion and welcome recommendations and suggestions in these matters, and will improve the project in the redesign and adaptive management when necessary

Thanks for your attention