The 5th Regional Stakeholder Forum
First Regional Information Sharing on Pak Lay Prior Consultation Process
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Navigation Review

Preparation of Technical Review Report for PNPCA Prior Consultation of Pak Lay Hydropower Project

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Contents of Presentation

Overview of submitted document
Approach for the technical review
Methodology for the technical review
The review of the Navigation subject under the scope of the Pak Lay HPP will contain the following items:

- Operation, safety and maintenance.
- Navigation structure design
- Filling and Emptying system
- Lock equipment

Information can be found in submitted document of the Feasibility Study:

- Chapter 5: Project layout and main structure
- Chapter 6: Mechanical and Electrical equipment and Hydraulic Steel structure
- Chapter 7: Construction Organization Design
Overview of the submitted document (cont.)

Drawings

• The general layout is available but not the technical files including detailed drawings in AutoCAD

General Layout of the Navigation ship lock – Pak Lay HPP
Approach for Technical Review

To assess the details of the plans and engineering specifications

To compare the proposed situation of the ship lock in the Feasibility Report against the PDG/DG/best practices

To provide outline recommendations

To define additional information and investigations review
Approach for Technical review (cont.)

*Issues to look at*

- Article 9 of the 1995 Mekong Agreement (freedom of navigation along the Mekong River, *not to pose an additional obstacle*) - provide for the construction of navigation locks

- Long-term nature of planning and investment for navigation locks with a view of *up to 50 years*

- *Lockage time will be kept to a minimum*, consistent with safe operation, safe movement of vessels in and out

- *Straight alignment* to allow for the safe entry and exit of vessels

- *The emptying/filling system is* designed to conform to requirements for maximum transit times
Approach for Technical review (cont.)

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The navigation structure:

- Maximum working head of the navigation lock
- A space for the ship lock for upgrading into a double-way lock
- Size of the lock chamber: 120 m long × 12 m wide × 4 m deep?
- The passing time of a ship is guaranteed not to exceed 30 minutes
- The access channel (generally accommodate two standard vessels of 500 tons).
- Entry and exit is safe
- Durability and maintenance requirements are reduced to lowest practical level
- Operation system (operation at least 12 hours a day, every day)
- Maintenance schedule (not more than 9 days/year)
Approach for Technical review (cont.)

Accessibility and others:

- **Access to ground structures** for maintenance and operation, access for emergency response is considered
- **Passage of small craft and family boats** is considered
- **During the construction**, the suspended time and additional cost to waterborne transportation is minimized
- **Reduce the environmental impact** of possible breakdowns or failures and include measures to mitigate any such impact
- Solutions for fine **material sedimentation**
- Hydraulics (currents), river morphology (sedimentation) and wind exposure take into account when determining the location and alignment of locks (using a simulation model)
Methodology

• Review with particular focus on Navigation ship lock and approach channels.

• **Discussion with relevant Hydropower Dam Designers and Government officers**

• Site visit

• Comparison with similar cases, best practices (as to compile recommendations)
Methodology

Guidance/Tool Documents:

• MRC’s Preliminary Design Guidance for Mekong Mainstream Dams in the Lower Mekong Basin (PDG) 2009;
• The MRC study “Review of International Ship Lock Dimensions and their Relevance to the Proposed Hydropower Developments on Mekong Mainstream dams”;
• PIANC report nr. 106-2008: “Innovations in navigation lock design”
• Various worldwide best practices such as studies conducted by USACE Various internet websites dealing with ship locks, river navigation, gates and valves for ship locks etc.;
Thank you