

## **“Navigation Lock”: A mode of transportation cares about local lifestyle and the environment**

The Xayaburi Hydropower Plant in Lao PDR, which began operations in 2012, has as one of its distinguishing features an architectural design that incorporates cutting-edge technology, developed under the guidance of world class experts.

As an artery carrying life throughout the region, the Mekong has been a source of sustenance, the seat of culture, a transport route, and a site of rituals to the people who dwell on either side of its banks for several generations. Furthermore, it is notable as a habitat for a variety of fish species.

During the flood season, it is common to see not only small boats belonging to villagers passing along the river on a daily basis, but also fishing boats, cargo ships, and ever-popular tourist boats, which are a source of employment and income for local communities. As for the drought season, it is not unusual for water levels in the Mekong to drop low enough for rock formations on the river bed to emerge, presenting an obstacle for water travel, especially in areas near the Power Plant, which are covered in naturally occurring rocks.

With understanding and appreciation of the way of life along the Mekong riverbanks, the Xayaburi Hydropower Plant placed great importance in architectural design that is conducive to navigation and considerate towards aquatic life in the river.

**Mr. Anuparp Wonglakorn**, Deputy Managing Director of Operation and Management at Xayaburi Power Company Limited, explained that the purpose of a navigation lock is to facilitate vehicles in passing through the structure of the Power Plant and traversing the river as they normally would. The navigation lock operates by using three sets of gates to either raise or lower water levels within the chambers through gravity flow, depending on direction of navigation. For example, when a boat is moving upstream, water from the upper lock chamber flows into the lower lock chamber in order to raise the water level. Conversely, when a boat traveling downstream enters the upper lock chamber, the water level within the chamber will be lowered via gravitational pull until it is equivalent to the downstream water level before the gate opens for the boat to pass through.

The structure and mechanics of the gravity-flow navigation lock also serve a dual purpose as a passageway for fish by creating currents that attract them to pass through.

### **Serving small and big boats**

The area of the Mekong where the Power Plant is located is covered in islets, presenting an obstacle to navigation during the drought season, especially for cargo ships and other large vehicles, which would frequently run aground on and be unable to pass over them. However, the construction of a navigation lock designed with consideration for the local lifestyle in mind has put an end to this formerly substantial problem.

The Xayaburi Hydropower Plant navigation lock is 12 meters in width and over 700 meters in length, able to accommodate the maximum required vehicle size of 2x500 ton convoys, and exceeds the minimum size requirement of 12 meters wide and 120 meters long.

The operation procedure is as follows: when the control tower receives a signal from a vessel, the officer will open one gate at a time in order to adjust the water level until it is flush with the downstream water level before allowing the vessel to pass through, a process which takes 40 minutes for each vessel.

The structure of the Power Plant helps maintain water levels high enough for navigation year-round, causing no disruption to commuters between Luang Prabang and Xayaburi.

Currently, there are cargo ships and tourist boats that pass through this waterway on a daily basis, and boats chartered by Western tourists from Luang Prabang have increased noticeably, with an average of 40 passing through each month. Meanwhile, residents of the riverbanks continue to travel along the river regularly, whether to fish on small boats or simply visit one other in surrounding communities. The Xayaburi Power Plant construction team has supplied a small tractor for towing boats upstream and downstream year-round as a courtesy to local residents.

Another unanticipated benefit of the Xayaburi Power Plant is that it has become a new tourist landmark in the Luang Prabang and Xayaburi region. Tour companies within the Mekong have begun to offer navigation lock tours for Thai, Laotian, and Western tourists in large boats sailing from north of Luang Prabang down to destinations like Vientiane.

It may be hard to imagine the number of tourists drawn to the navigation lock: each week, the control tower welcomes no fewer than seven boats carrying tourists who wish to view the operation of the three gates from the deck of their boats while it passes through the navigation lock, a process which takes 40 minutes.

**All this reflects the care and consideration that CKPower has placed in community integration through its aim to construct a power plant that is environmentally friendly and conducive to the local lifestyle for truly clean and sustainable energy.**

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