Name: BUN VICHET
From: Cambodia
Presentation:
Hydropower Lower Sesan 2

01 Overview of the plant

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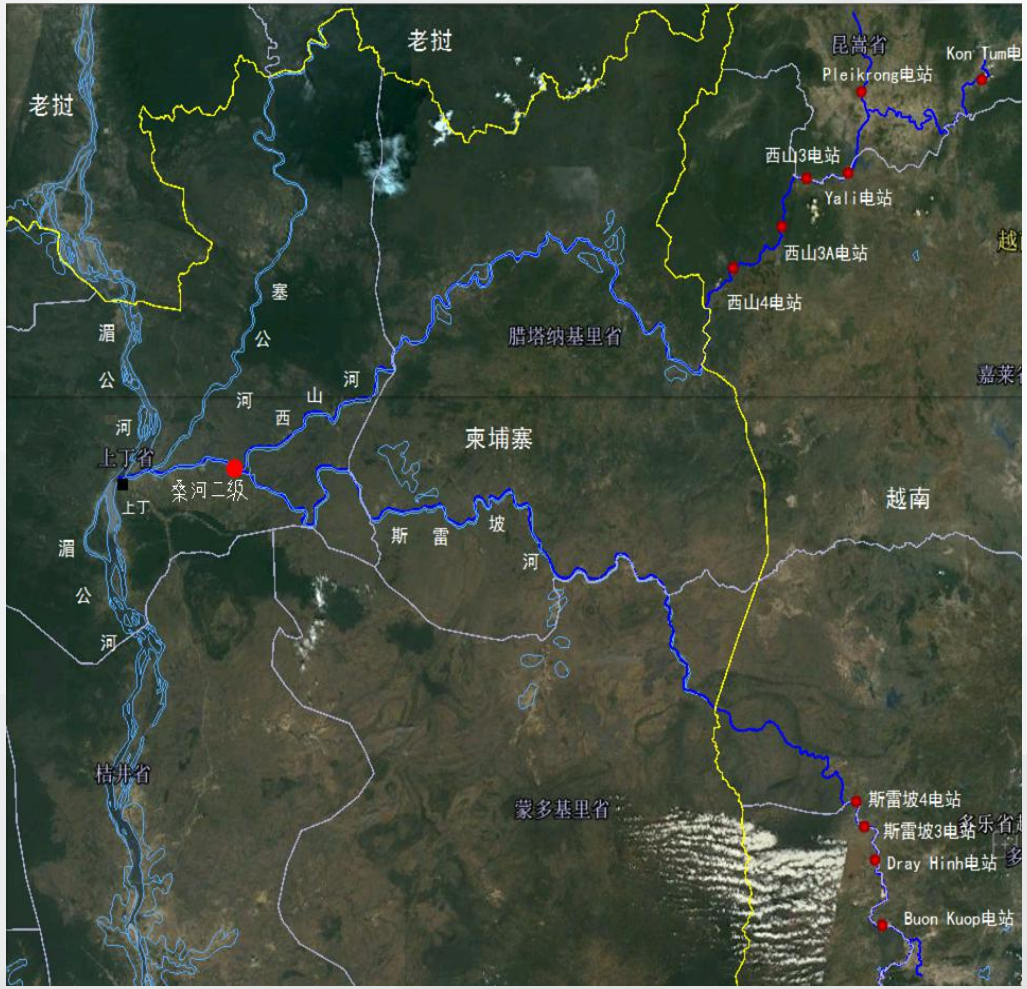
Part 01
Overview of the plant

01 Location

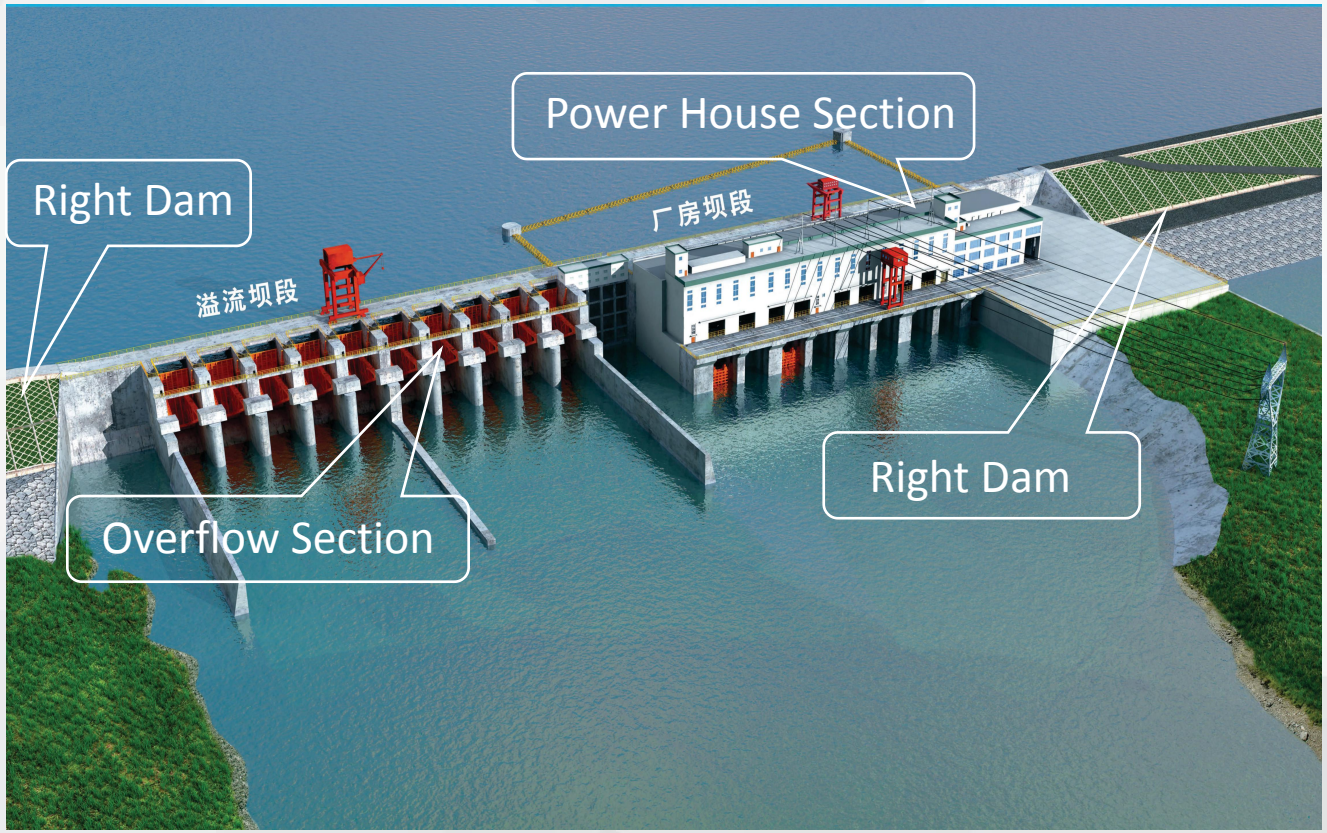
Where is the project



The power station is located in Stung Treng prvince , about 1.5km downstream of the Intersection of Sesan and Srepok river and 25km downstream of the Stung Treng province .

02 Significance

What is the project



The project consists of the dam、overflow section、power house section and so on .The length of dam is 6.5km and it is the longest dam in Asian so far.

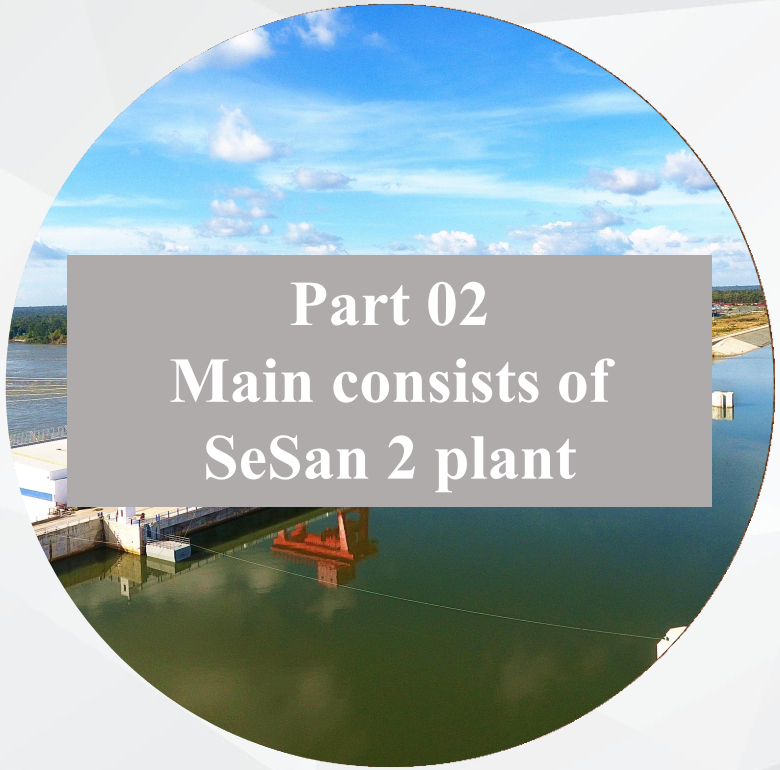
The total capacity is 400 MW, including 8 units, each one is 50 MW. Currently it is the largest hydropower station in Cambodia, the average annual capacity is 1.9 billion kWh per year.

03 Significance

Why we need to build the project

Hydro Power Lower SeSan 2 construction conforms to the energy development strategy of the kingdom of Cambodia, when it's completed, it will provide stability and reliablity green power for Cambodia Transmission System.

On the other side, it is good for improving the power structure and protecting the ecological environment in Cambodia, it is also good for promoting regional economic development.



Part 02
Main consists of SeSan 2 plant

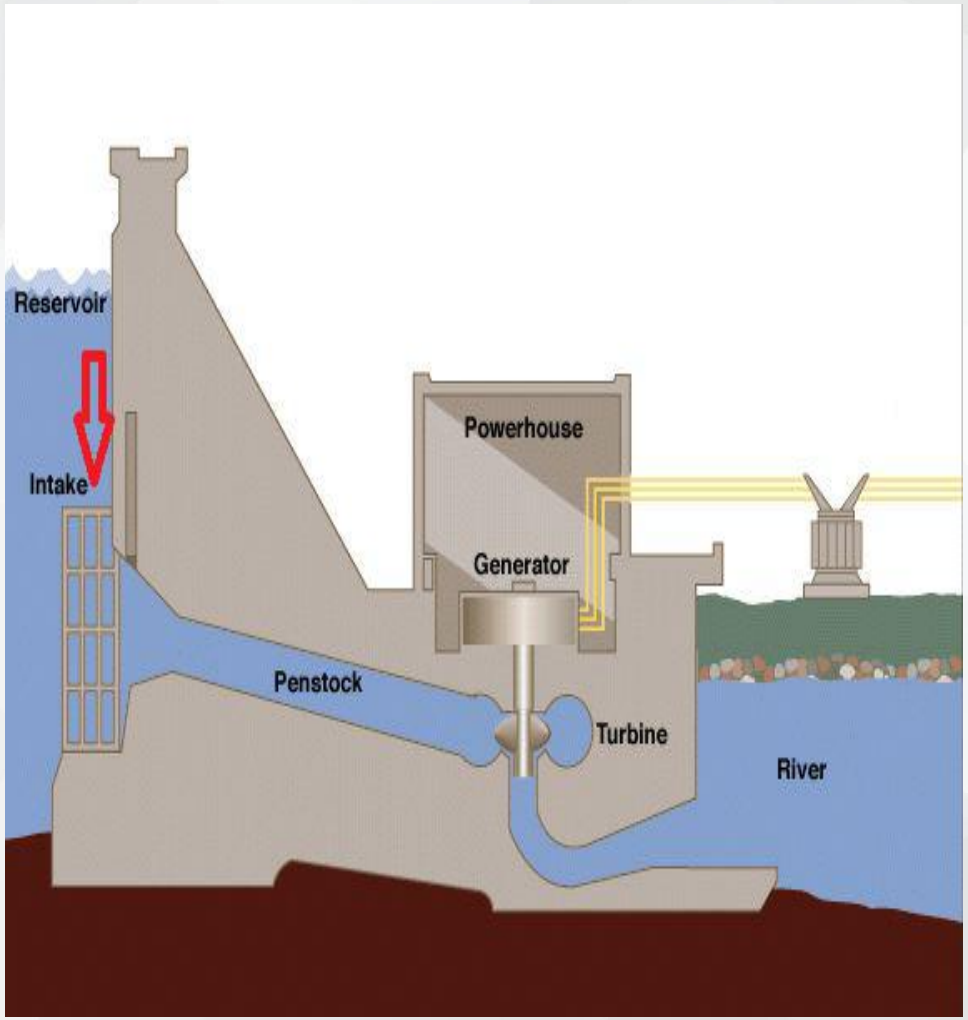
Main electrical connection

Every unit contains one turbine,one generator,one main transformer and a set of associated equipments.

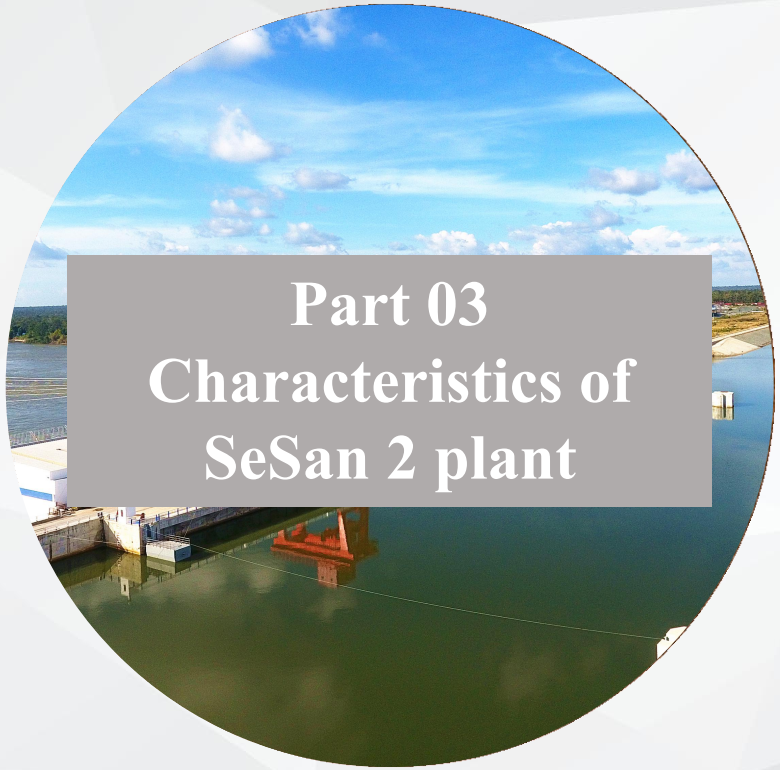
230kV system is double busbar running in parallel,it has 8 lines input and 2 lines output,connect to Stung Treng substation.It can be extended to 8 lines input and 4 lines output if necessary.

There is a 35kV line connect to the Stung Treng substation which can output the power to satisfy the local demand.

Intake or Control Gates



These are the gates built on behind the dam. The water from reservoir is released and controlled through these gates. These are called inlet gates because water enters the power generation unit through these gates. When the control gates are opened the water flows due to gravity through the penstock and towards the turbines.



Part 03
Characteristics of SeSan 2 plant

01 Bulb turbine units

Bulb turbine units are the best choice for SeSan , because it is located in the plain where it is not possible to choose a high dam to store water.

Bulb turbine units with good hydraulic characteristics ,it has large flow capacity and its efficiency is high. Due to the flow channel of the bulb turbine units is straight， water flows uniform, so the lose of energy is little. Compared with the axial flow turbines which have the same water head, the highest efficiency is 2% higher than it. But it must be operating within the allowable head, over the design of the water head, the efficiency will be decline seriously, the vibration will be increase, long time operation will cause damage to the units.

02 Layout of the units

The Bulb turbine units using horizontal layout, installed in the flow channel, so the space is limited,but the generator has large number of magnetic poles and the distance between poles is small, what makes the layout and design of the poles are difficult.

Compared with other types of the units, the turbine generator is hot an d the cooling space is small, under-excitation operation need to be limited in the range

03 Dual control

In SeSan we not only have 16 guide vanes, but also have 5 runner blades, and the blade must be controlled at the same time. There is a coordination between the guide vane angle and the runner blade opening to keep the best efficiency.

04 The electric transmission line

The distance of the transmission line from SeSan plant to the load center is about 336km,the long distance lead to the voltage of transmission line is on the high side which is near the highest voltage limit that the electric primary equipments can bear.

At the same time the high voltage at the end of the transmission line isn’t good to the units to parallel in the system, reserve reactive power and operate in leading phase.

Part 04
The mode of operation management

The operation and maintenance department is responsible for the operation and maintenance of The whole plant equipment.

Now there are four teams, the operation team, the mechanical team, the electrical team and the electric secondary team. The operation team is responsible for the equipment control and inspection. The electric secondary team is responsible for excitation, Protection, governor and monitoring equipment maintenance , the electrical once team is responsible for the generator, 10kV plant power system, GIS and outlet equipment maintenance ,the mechanical team is responsible for turbine maintenance.

When it comes to on-off and load adjustment, you need to apply to NCC, with the consent of NCC before implementation.

Thanks

For Your Watching