

## **EVN 's Activities (/c3/pages-c/EVN-s-Activities-66-163.aspx)**

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### **Repairing Xekaman hydropower 3: Shared by insiders**

**Assigned with consulting on technical design and construction drawings of repair solutions for Xekaman 3 Hydropower Plant project (in Laos), Power Engineering Consulting Joint Stock Company 1 (EVNPECC 1) has overcome all difficulties, affirming the capacity of a professional and reputable consulting unit under EVN. News website [evn.com.vn](http://evn.com.vn) had an interview with Mr. Nguyen Huu Chinh - General Director of EVNPECC 1 about this project.**



*Mr. Nguyen Huu Chinh - General Director of EVNPECC 1*

Xekaman 3 Hydropower Plant Project is implemented by Vietnamese investors in Xekong province (Laos). The project has been put into operation since 2013, but during the operation of the machine, the pressure pipeline encountered some problems in the upstream pressure pipeline causing the machine to stop. Therefore, in order to ensure the quality and reputation of the Vietnamese side, in Notice No. 135/TB-VPCP dated 31 March 2014, the

Prime Minister of Vietnam has assigned the Vietnam Electricity to direct *EVNPECC 1* to be the consulting unit to set up technical design and construction drawings for long-term repair solutions to pressure pipelines and upstream excavated slopes of the plant.

Unit 1 of the plant has been commercially operated again at 7:30 a.m. on 22 May 2022; Unit 2 at 5:30 pm on 2 June 2022, timely generating and transmitting power to Vietnam under the contract signed before the hot season.

*Reporter: When participating in this project, how did EVNPECC 1 encounter difficulties and complications, sir?*

**Mr. Nguyen Huu Chinh: The first problem is that engineering geology is very complicated. EVNPECC 1 has conducted many additional geological survey drilling holes, with holes down to over 250m deep. Therefore, the boring work is extremely difficult due to the risk of collapsing the borehole wall. The assessment of geological structure is very easy to cause wrong judgment if the survey is not deeper than the specified depth for normal projects.**

Secondly, this is a repair project, so making the most use of existing works can reduce costs for the investor, but ensuring the safety of the work is given the first priority.

Thirdly, the project design is verified through many rigorous steps in terms of design standards and quality from many independent domestic and foreign consulting units.

Facing these challenges, EVNPECC 1 has used professional boring force to make boreholes with a depth of over 200m that still encounter the rolling bed layer. The geological profile is also verified by micro-seismicity from Terravox Company of the Russian Federation. As a result, the engineering geological model prepared by EVNPECC 1 ensures high accuracy, overcoming the limitations of geological diagrams in the previous survey periods.

Regarding the design solution to work in weak geology, a thick layer of cover, EVNPECC 1 has chosen the solution to put the new pipeline deep down so that most of the length of the pipeline is in the lightly weathered rock zone (IIA) to medium (IB). At the tunnels that are expected to have to be cut through very bad geology with soil up to 150 - 180m thick, EVNPECC 1 has proactively devised a plan to arrange a drainage borehole in combination with exploration in advance to accurately determine the weak zone position. The temporary support measure for this area is made of high-strength I600 steel for the excavation trench with a diameter of up to 8m combined with drilling to create a hole on the roof of the tunnel.

Besides, EVNPECC 1 pioneered in applying new technology to strengthen old pipe segments. The inside of the old steel pipes is glued with additional layers of high-strength carbon fiber reinforced polymer, up to 28mm thick. ***This is the first project in the world to apply carbon fiber reinforcement with a pressure head of over 500m for large-diameter pipes.***

*Reporter: With such a complex repair project, how has EVNPECC 1 mobilized human resources for this project?*

**Mr. Nguyen Huu Chinh: EVNPECC 1 has gathered collective wisdom to participate in the design survey and site consultation for the long-term repair plan. The leaders and former leaders of the company directly monitored and directed the consulting work for the project. Company leaders as well as myself have dozens of times directly inspected the site and given many comments on the design survey work.**

The team directly participating in the design survey are the best experts of EVNPECC 1 on hydropower. The design manager is the technical director of EVNPECC 1, an excellent hydropower development master graduating in Norway, with extensive experience in surveying and designing underground projects of EVNPECC 1.

During the construction of the project, staffs of EVNPECC 1 were constantly present at the construction site to ensure the author's supervision and description of the foundation pit, and to promptly adjust the design according to the field conditions.

In the context of the COVID-19 pandemic, the geotechnical engineers of EVNPECC 1 have been on duty at the construction site for years without taking leave, including holidays.



*Xekaman 3 Hydropower Project. Photo source: DVCC*

*Reporter: Through this project, what experiences have EVNPECC 1 gained, sir?*

**Mr. Nguyen Huu Chinh: The team of EVNPECC 1 has developed tremendously in surveying - experimenting, designing and repairing works under bad geology.**

Lessons learned from programming, training and supporting the implementation of monitoring for investors have helped the company gain more experience in geological monitoring and modeling for projects with geological stability problems. The design according to EU - G7 standards as required by the Laos Government has helped EVNPECC 1 gain more experience in designing international standards for foreign projects such as Nam Mo 2 hydropower plant in Laos or Tanahu hydropower plant in Nepal.

After conducting the test results of carbon fiber reinforcement, EVNPECC 1 is completely confident to apply this solution when reinforcing some other pressure pipelines or hydraulically reinforced-concrete structures in Vietnam.

*Reporter: What is the significance of this Xekaman 3 Hydropower Plant project in contributing to ensuring power for Vietnam, sir?*

**Mr. Nguyen Huu Chinh: This project provides nearly 1 billion kWh of power annually to Vietnam, contributing to ensuring energy security for our country in the hot season this year.**

At the same time, the resumption of power generation provides a significant source of tax revenue for the Laos Government. The project also contributes to tightening the friendship between the two nations.

On the side of EVNPECC 1, we wish to accompany the investor of the Xekaman 3 Power Plant Project and other potential investors in power source projects in Laos, including hydropower, thermal power and renewable energy. EVNPECC 1 is also making efforts to promote design consultancy in power transmission from Laos to Vietnam to increase the capacity to connect the power grid in the region, helping to solve the problem of energy development in Vietnam.

*PV: Thank you, sir!*

### **Xekaman 3 Hydropower Plant:**

- It's an open-air plant
- Including 2 units, a capacity of 125MW/group
- Average design power: 982 million kWh
- Stone dam with concrete plates on the surface: 101.5m high
- Concrete-covered water tunnel: diameter 4m; length 5,862.6m
- Armored pressure pipelines are mainly located underground, with a diameter of 3.6 to 3.1m, with 2 vertical wells in a total length of 1,474.65m.

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## **Other News**

- ▶ Two corporations in EVN were honored as Enterprises receiving international certification in Gender Equality (02/06/2022) (/d6/news/Two-corporations-in-EVN-were-honored-as-Enterprises-receiving-international-certification-in-Gender-Equality-66-163-2872.aspx)
- ▶ Tuyen Quang Hydropower Company has contributed over 18 billion kWh to the national power system (02/06/2022) (/d6/news/Tuyen-Quang-Hydropower-Company-has-contributed-over-18-billion-kWh-to-the-national-power-system-66-163-2878.aspx)
- ▶ International workshop on equitable energy transition (02/06/2022) (/d6/news/International-workshop-on-equitable-energy-transition-66-163-2877.aspx)
- ▶ Sufficient power supply to be ensured in 2022: Ministry (02/06/2022) (/d6/news/Sufficient-power-supply-to-be-ensured-in-2022-Ministry-66-163-2899.aspx)
- ▶ Lao official works with leaders of BIDV, EVN (01/06/2022) (/d6/news/Lao-official-works-with-leaders-of-BIDV-EVN-66-163-2943.aspx)
- ▶ EVNHCMC's new Omnichannel Contact Center helps diversify customer communication (01/06/2022) (/d6/news/EVNHCMS-new-Omnichannel-Contact-Center-helps-diversify-customer-communication-66-163-