

**Abstract**

Poringalkuthu HEP- Forced outage on 9MW Unit No.3 Machine due to excess Vibration problem caused by Deluge in 2018 –formation of “Expert Committee”-- Sanction Accorded– Orders issued.

**Corporate Office (SBU-G/E)**

B.O.(FTD) No. 482 /2020 (No. DGE/G3/PLB/2020-21 Thiruvananthapuram

dated: 16 -07-2020

- Read:-
1. Letter No.CEG/AEE VI/Poringalkuthu PH/Unit #3/2020-21/532 dated 09-07-2020 of the Chief Engineer(Generation &PED),Moolamattom.
  2. Note No.DGE/ G3/PLB /2020-21 dated 13-07-2020 of the Director (GE & SCM) (Agenda Item 29/7/2020)

**ORDER**

The Poringalkuthu Hydro Electric Project, 32 MW (4 x 8MW) was originally commissioned during (1957-1960) and re-commissioned after renovation during 2005, with an enhanced capacity of 36MW(4x9 MW). The project is located at the tail end of the Sholayar HEP which utilize the tailrace discharge from the Sholayar Power House, spill from the Sholayar dam and water inflow from its own catchment area. Since, all units in the station have been in operation for an average duration of more than 50 years, the renovation and modernization work (RMU) of the project was planned and executed through the consortium of M/s Allonward –Shree Saravana Industries Private limited (SSIPL) and the work was completed on 26.05.2015.

The project was almost completely damaged in the deluge in 2018 and accumulation of mud water along with sand and debris in the power house caused considerable damages to the machines and associated equipment. The machine floor, Turbine floor, MIV,PLC panels of MIV and Governor servo units and the Electronic cards were completely submerged in mud and water and the power generation was not possible without removal of those obstructions and rectification of the damaged components.

Subsequently, rehabilitation works were scheduled and completed on war footing by constituting a team including KSEBL employees and contract workers. The Unit No.1, Unit No.2, Unit No.3 and Unit No.4 machines were put back into service on 11.10.2018, 31.10.2018, 28.11.2018 and 26.12.2018 respectively after restoration works. Even though the machines were put back in service, as scheduled, the Unit#3 was put under forced shutdown from 21.02.2019,for the rectification of excess vibration problem. It is reported that during flooding of turbine floor on 16-08-2018, both AC and DC supply systems were failed and unit#3 had to run continuously for two days, without cooling system which might have led to the excessive vibration, due to overheating of bearings and other components of the machine.

The initial rectification attempt was carried out with the help of Sri.Gopinathan, (Rtd. Executive Engineer, KSEBL) who is an expert in this field and the works were completed by the last week of May 2019. But on completion of the work the Power House was under total shutdown for 55 Days for the replacement of old trash racks of the Intake Gate in Poringalkuthu reservoir.

After Shutdown works in the Poringalkuthu reservoir, Spinning of Unit No.3 Machine was carried out, but the “Shaft Swing” of the Machine was found to be very high. The matter was reported to the Director (Generation -Ele.) & SCM). In order to address the issue, a meeting was conducted at the O/o the Chief Engineer(Generation &PED), Moolamattom on 05.07.2019.Later ,the work was tendered ,as directed and it was awarded to M/s Shree Abirami Engineering works, Chennai. They have started the work on 13.11.2019. The re-babbiting of the Bearing Pads for the Thrust Bearing, LGB, UGB and TGB has been done and carried out the alignment of the Shaft and conducted trial run for 2 times, but the result was not satisfactory. Meanwhile, Sri. Shaji K Mathews, Executive Engineer, Moolamattom has been deputed for inspection of the Machine and conducted the inspection on 12.03.2020. It has been pointed out that the problem is with the Thrust Collar, i.e. “ the inside dia. of Thrust Collar is more than the Shaft dia. and Key was loose”. This might have happened due to the running of the machine continuously without cooling during the flood.

Based on the above findings, the contractor dismantled the Thrust Collar from the Rotor shaft and it was taken to workshop at Coimbatore on 13.03.2020 in anticipation that machine would become ready after carrying out the refurbishment work on Thrust Collar.But,due to the Nationwide Lockdown imposed due to COVID-19 Pandemic, the facility at Coimbatore became Hotspot area and therefore the Workshop was closed and refurbishment work on the Collar was affected. The contractor requested to extend the\*time period of work pointing out the COVID-19 Pandemic conditions. Also ,M/s Abirami was unable to bring their experts from Tamil Nadu or from abroad due to National wide Lockdown.

After constant follow-up with M/s Abirami and District Administration, Palakkad and Coimbatore, they have transported the Thrust Collar from Coimbatore and finally arranged the balance work at Chingavanom. After completing the refurbishment work, the Thrust Collar was brought to PLB PH on 29.05.2020. After assembling, it was again taken out on 09.06.2020 for incorporating final correction works at HMT, Kalamassery. Then it was brought to PLB PH on 10.06.2020 and the same was assembled to the Rotor shaft with proper corrections in the alignment of the Rotor Shaft. The Run-out of the Shaft was taken and the readings thus obtained were satisfactory.

The final assembling of the Machine was done and the Mechanical spinning was conducted. But some readings were found to be higher than the desired values. The readings were not satisfactory when the Machine was excited too. On repeated inspection due to the deviations observed, the Vibration Team re-inspected the Machine and pointed out the potential deviation in the Rotor Shaft dia. and recommended for adjusting the clearances of Bearing Pads before coming into a final conclusion on severity of shaft problems. The contractor, M/s Abirami is carrying out the corrections as per the recommendations put forward by the Vibration Monitoring Team.

In the above circumstances, the Chief Engineer(Generation & PED) as per paper read (1) above has requested for constituting an "Expert Committee" with the experts from KSEBL, before proceeding further and nominated the following Engineers, to investigate the causes of persisting vibration of Unit #3 and requested sanction for the same.

1. Sri. Shaji K Mathews, DYCE, Moolamattom
2. Sri. Rajendran V, EE, PMD, Moolamattom
3. Sri. Aji Joseph, AEE, Moolamattom
4. Sri. Radhakrishan C.G, AEE, PET Sub Division, Moolamattom
5. Sri. Anwar A.A. AEE, GSD, Poringalkuthu.

Having considered the recommendation in the Note read as 2<sup>nd</sup> above, the Full Time Directors meeting held on 14-07-2020, resolved to constitute an Expert Committee for ascertaining the cause of vibration of Unit#3 at Poringalkuthu HEP and to propose remedial measures to be taken to eliminate the problem with the following members.

1. Sri. Shaji K Mathews, DYCE, Moolamattom -(Convenor)
2. Sri. Rajendran V, EE, PMD, Moolamattom
3. Sri. Aji Joseph, AEE, Moolamattom
4. Sri. Radhakrishan C.G, AEE, PET Sub Dvn, Moolamattom
5. Sri. Anwar A.A. AEE, GSD, Poringalkuthu
6. Sri.Shine Raj,Assistant Engineer,Renovation Division,Moolamattom

Further resolved that the Committee shall submit a comprehensive report based on the Terms of Reference and time line as follows:

**Terms of Reference**

- I. Finding out root cause of the vibration
- II. Recommend the measures to be taken to rectify the vibration problem.
- III. Examine the need for replacement of any equipment.

**Time Line**

The expert committee shall furnish their report along with recommendations and suggestions within 15 days.  
Orders are issued accordingly.

By Order of the Full Time Directors,  
Sd/-  
**(LEKHA.G)**  
Company Secretary  
(In-charge.)

To:  
1. The Chief Engineer (Generation & PED), Moolamattom.  
2. All Committee members

Copy to:  
The Chief Internal Auditor,  
The TA to CMD/D(GE&SCM)/ D(TSO&S)/ D(DIT&HRM)/D(GC)/D(C&P)  
The Fair copy Superintendent/Library/Stock File

Forwarded / By Order  
  
Asst. Executive Engineer