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2nd PRMC MEETING

Date: 16th February 2018

Venue:Si'Tarc, Coimbatore.


Time : 2:00 PM

Members Present

- 1) Dr. D.N. Badodkar – Chairman PRMC
- 2) Shri. Sanjay Chavre - Member Secretary - Smart Pump Project / SDO - DHI
- 3) Mr. K.V. Karthik - Chairman - Smart Pump Project
- 4) Dr. M. Sundaram - Convenor - Smart Pump Project
- 5) Mr. C. Muthusamy- Managing Partner - Stark Motors,Member PRMC
- 6) Dr. C. Murugesan, VP-Design and Development, Industry Expert
- 7) Dr. V. PrasannaMoorthy - Faculty GCT,Coimbatore, Member PRMC
- 8) Dr.B.V.S.S.S – Professor and Head, Mech Engg Dept, IIT-Madras
- 9) Dr.Punit Singh -IISc-Bangalore
- 10) Dr.Prabhu - PSG-Coimbatore
- 11) Dr. L.G. Das – CMERI, Durgapur
- 12) Dr. Pranab Samanta – CMERI, Durgapur

Agenda

- 1) Leave of Absence.
- 2) Confirmation of minutes of **1st PRMC Meeting held on 1st August 2017**
- 3) Progress of project
 - Motor Part
 - Pump Part
- 4) Presentation by IISc Bangalore, IIT Madras, CMERI and PSG CT.
- 5) Remarks by Chairman.
- 6) Other Subjects.
- 7) Conclusion and Vote of Thanks.

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Proceedings:

Chairman of Smart Pump Project – SSP- K.V.Karthik welcomed the PRMC members for the second PRMC meeting and read the circulated agenda. The meeting proceeded as per the agenda. Karthik requested Dr.B.N.Badodkar to chair the meeting

Agenda 1 –

Leave of Absence

- 1) Mr.N.Sivanand, Joint Secretary, DHI
- 2) Shri. Bhaskar Sarkar - Executive Director - EEPIC India
- 3) Ms. Padma Ganesh - Deputy Secretary - DOC

Have applied for leave of absence. The committee approved the leave of absence

Agenda 2

Confirmation of Minutes of 1st PRMC Meeting held on 1st August 2017

The minutes of the first PRMC meeting held on 1st August 2017 has been circulated. There was no comments received and the committee approved the minutes.

Agenda 3 - Progress of project

Mr.Karthik explained the action taken on the points discussed during the last meeting to the committee. He also informed the reasons for delay in execution of the project mainly to the non achievement of the required efficiency in the pump portion.

The presentations of the teams followed


Pump Part

IISc and PSG combined presentation - Dr.Punit Singh,IISc and Dr.Prabhu,PSG

- 1) The team described the inverse design methodology adopted for this project. The various designs made and the tests carried out on all of them were shown. The results of tests conducted with coating and without coating were also shown. The various losses occurring due to leakage, recirculation was informed through simulation. The reduction of the clearance between the impeller and diffuser has given the highest efficiency increase of 7 points. The team was assisted by research scholars Mr.Ravi Singh and Fenil of IISc and Mr.Gokul of PSG CT.

CMERI, Durgapur presentation by Dr.Lal Gopal Das

- 1) Dr.L.G.Das presented his research on the design for the duty conditions by using conventional method. The test results of this design has given a lower efficiency at the duty point. His proposed methods for improvement of the efficiency by reducing losses in pump side.

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IIT Madras – Dr.B.V.S.S.Prasad and Dr.Dhiman Chaterjee

- 1) Presented on the results of simulation done on the designs of IISc and CMERI. They gave a in depth analytical analysis on the designs. It was informed by them that first H vs Q characteristics can be compared rather than only the efficiency. It was shown that CMERI design has better performance at the whole range while IISc and PSG designs have better performance at the duty point.

Comments:

Shri Sanjay Chavre opined what made IISc consider inverse design, before analyzing the other methods of designs available that can be identified through patent searches, literature study etc.

Dr.Murugesan – Industry expert informed that already various research papers had presented in depth study of inverse design and informed that this has been one of the positive developments in engineering design since 1990's. Hence choosing this method was the wisest option.


Dr.Badodkar asked the team to study the effect of water entering at the inlet and the losses associated with it to be studied and also axial distance between the impeller and diffuser which can affect the efficiency considerably. The team agreed to study these effects.

Mr.K.V.Karthik, informed that the experience gained has been tremendous and opined that a new soft ware be created with this expert team that can be of great use when developing the entire series of pumps. Dr.Prasad agreed that this is possible. Mr.Sanjay Chavre informed that this could be taken up as the second phase of the project.

Bearing, Shaft and Journal part

CMERI, Durgapur – Dr.Pranab Samanta and Mr.Phani Kumar

The team presented the results of various analysis done on the thrust pad part and improvements done on analysing the textures on the thrust segments. The profile textures have shown greatest improvement in load bearing capacity in simulation. The profiles could be made only in micro machining of 20 microns to 10 microns. The facility available in CMERI is under maintenance. Mr.Sanjay Chavre suggested CMTI could have this facility. The team agreed to look into various external options.

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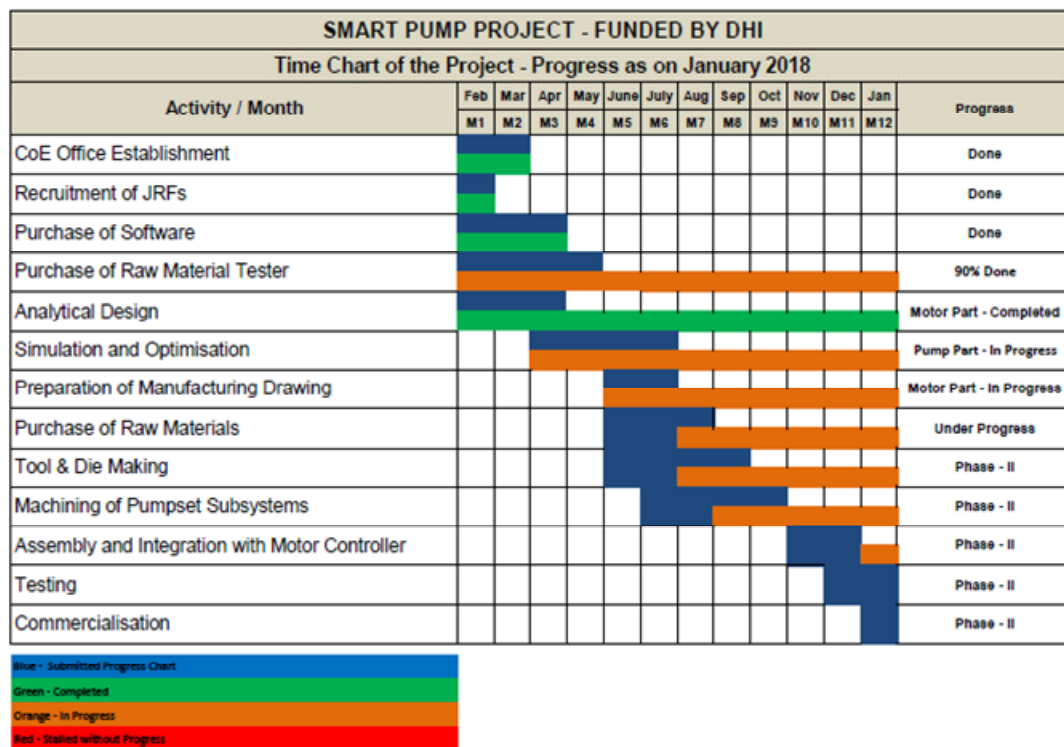
Motor Part


PSG College of Technology - Dr.M. Sundaram

Presented on the design and development of permanent magnet BLDC motor. The verification of the performance by detecting back EMF of the machine was shown. The modular design concept that could be used in development of higher ratings of the motor was presented. The testing of the initial prototype with external controller was displayed to the committee. The results obtained after the initial test has shown that the motor has achieved the required speed.

The committee appreciated the efforts and requested the team to conclude the design of the controller part at the earliest.

Mr.Karthik Chairman SSP presented the time chart of the progress of the project



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And informed that project has extended its time limit due to difficulties encountered in procurement of testing equipments and due the pump part and requested for a time extension of six months. The revised progress chart and mile stones were presented.

The financial details of amount expended, the purchase committee meetings held for procurement of equipments and the utilization of the grants received were also presented. The grants have been completely utilized and all the equipments as in the DPR has been procured and installed.

Conclusion and Remarks

- 1) The committee expressed its satisfaction on the progress of the project but also opined that scope of improvement in adhering to time schedules is present and asked the team to speed up the efforts.
- 2) The PRMC has recommended for extension of time period by six months upto July 31st 2018.
- 3) The PRMC also recommended the sanction of second phase of grants for the project.

The meeting ended with a vote of thanks to the Chair and members by K.V.Karthik, Chairman Smart Pump Project.