

**DESIGN & DEVELOPMENT OF ADVANCED TECHNOLOGIES FOR HI-TECH
SHUTTLELESS LOOM (LR 450)**

Minutes of 1st PROJECT REVIEW & MONITORING COMMITTEE (PRMC) meeting,

Held on 22-MAR-2017 at CMTI.

Members present

Project Review & Monitoring Committee (PRMC)

Prof. S. M. Ishtiaque	Chairman
Shri. Vivek Plawat	Member
Dr. M. K. Talukdar	Member
Shri. D. Yuvaraj	Member
Dr. K. Selvaraju	Member
Shri. Sanjay Chavre	Member Secretary

PRMC Members - Leave of Absence

Shri. S. Balaraju	Member - Convener
Shri. Neeraj Kela	Member
Dr. Prakash Vasudevan	Member
Shri. T. Parabrahman	Member

Textile Machinery Manufacturers' Consortium (TMMC)

Shri. Vallabh S Thumar	M/s Alidhra Weavetech
Shri. Ketan Sanghvi	M/s Laxmi Looms
Shri. Ashish Amin	M/s Premier Looms
Shri. M. S. Satish Raj	M/s Vaari Textiles

TMMC Members - Leave of Absence

Shri. Dilip J Dhamanwala	M/s Life Bond
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Textile Machinery Manufacturers' Association (TMMA)

Shri. S. Chakraborty	Advisor, TMMA
Shri. Sachin Kumar	Secretary, TMMA

Regional Textile Commissioner's Office (RTCO)

Shri. Gaurav Gupta	Assistant Director
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Central Manufacturing Technology Institute (CMTI)

Shri. S Satish Kumar	Director Incharge
Shri. B. R. Mohanraj	Joint Director (P.I)
Shri. S. V. Mansur	Sc-E (Proj. Coordinator)
Shri. R. S. Suresh	HOD - DDC
Shri. Indrajit Ghosh	HOD - PAT
Shri. K K Rajagopal	HOD - CPC
Shri. V G Yoganath	HOD - PMD
Shri. R S Honnatti	HOD - Purchase
Smt. Asha Upadhyaya	Sc-E
Shri. J. G. Arun Kumar	Sc-E
Shri. S. Narashimmalu	Sc-E
Shri. P. Rajasekhar	Sc-E
Shri. P. Agarwalla	FA & CAO
Shri. S. K. Ananth	Technical Consultant
Shri. P.K. Mukherjee	Technical Expert, Weaving
Shri. R. Baglodi	Technical Expert, Assembly & Testing
All Project Execution Team Members	

Meeting Session - Project Overview & Review with PRMC, TMMC & TMMA

Introduction

Shri. S Satish Kumar, Director I/c, CMTI, welcomed PRMC chairman & members to the meeting & introduced them to the gathering. He briefed about the project and stressed to focus on Design Innovations in the textile machinery industry. He also acknowledged the role of Shri. S. Chakraborty in initiating the project.

Shri. Sanjay Chavre, Member secretary, PRMC & SDO, DHI, briefed about the background of PRMC constitution and requested PRMC members to provide the necessary guidance in achieving the goals of the project.

Prof. S. M. Ishtiaque, Chairman, PRMC & Professor, IIT, Delhi, mentioned that less than 10% of fabrics are produced from shuttleless looms in Indian Textile Industry. He stressed on the need to reduce the dependency on imported used machineries. He also stressed on the importance of Industry participation in Technology creation and bridging the gap between Academia & Industry for enhancing the global competitiveness of textile industry. He appreciated the initiative by DHI & CMTI of developing indigenous looms and assured that all necessary assistance for loom development will be provided.

Dr. M. K. Talukdar, indicated that there is a huge potential for shuttleless looms in Indian textile industry. He also stressed on the need for development of rapier looms and appreciated the initiative taken by DHI & CMTI. He also assured CMTI of all support for the development of looms.

Dr. K. Selvaraju, mentioned that during the past three decades lot of foreign exchange is lost due to import of textile machineries. He mentioned that there is a huge potential for shuttleless looms and are targeting to add 2 lakh shuttleless looms by 2025. He assured that the user industry will provide all the necessary support for the indigenous development. He also suggested to consider the development of air jet looms for higher productivity at a later stage.

TMMC & TMMA members briefed the PRMC about their activities and expressed their satisfaction in the overall project progress. Shri. Sachin Kumar appreciated the joint venture of TMMC members for the successful collaboration with DHI & CMTI to develop looms.

Shri. S Satish Kumar, highlighted the extensive Intellectual Property Rights (IPR) on various sub-systems and particularly the weft insertion mechanisms by the global players. He emphasized that the development of novel weft insertion mechanisms was a great challenge considering the degree of complexity and IPR issues. CMTI has taken up the challenge and designed SIX novel weft insertion mechanisms, among which TWO mechanisms are developed and tested at 450 ppm on the test bench. The best of these TWO novel mechanisms is deployed in the prototype loom and patenting will be taken up. The conceptual design of other FOUR novel mechanisms is completed and will be developed and tested during the 2nd phase of the project.

Project Presentation

CMTI project team presented the overview of the project and the proposed technical specifications of first prototype loom under development. CMTI mentioned that the project is being executed in two phases wherein, Phase-I (April 2015 to March 2017) involves the development of one number of high speed shuttleless rapier loom operating at 450 picks per minute and Phase-II (April 2017 to September 2018) involves the development of two numbers of advanced variant of high speed shuttleless rapier looms operating at 550 picks per minute. CMTI briefed PRMC about the constitution of Project Management Board (PMB) consisting of the following members for quarterly review of the project progress:

- a) Shri. B. R. Mohanraj, CMTI
- b) Shri. K. K. Rajagopal, CMTI
- c) Shri. Sanjay Chavre, DHI
- d) Shri. S. Chakraborty, TMMA
- e) Shri. Vallabh S Thumar, TMMC
- f) Shri. S. V. Mansur, CMTI

CMTI mentioned that a kick-off meeting and SIX PMB meetings were held since April 2015 and 7th PMB meeting was held on 21-Mar-2017 at CMTI.

CMTI explained PRMC about the project objective, realization strategy, product & process studies carried out so far, survey & exposure visits, training, technological challenges, milestones, various issues related

to BOI and current status. CMTI highlighted that currently, the project is completing 24th month of execution and Design phase of the project is complete and Manufacturing of parts is in progress. The further activities like Assembly, Interfacing of various sub-systems, Testing & Trial runs will be completed by July 2017. CMTI briefed the committee that the delay in completion of Phase-I is due to intense IPR on high speed weft insertion mechanisms, manufacturing of critical components, selection of high performance main drive motor, development of PLC based controller and support issues with OEMs for critical high technology sub-systems like dobby, motor, drives, PLC, etc., for one-off prototype development. In view of that, CMTI requested the committee to recommend extension of the Phase-I duration till September 2017 and also assured that the overall project completion date will still be September 2018. Considering the technological challenges of the project and the quantum of work done by CMTI till date, the PRMC recommended for re-appropriation of phase-I duration till Sep 2017.

CMTI presented the financial progress and Shri. Sanjay Chavre, suggested CMTI to share among PRMC members, the Financial & Technical progress in comparison with sanctioned targets.

PRMC Suggestions on Loom Development

Dr. M. Talukdar suggested the following points:

- a) CMTI may explore the possibility of providing different shedding mechanisms like Cam box, Dobby and Jacquard in different versions of looms to suit the requirements of different market segments.
- b) The technical specifications of the prototype machine should include minimum (190 cm) along with maximum reed width (220 cm).
- c) Loom may be made compatible with Tuck-in selvedge also.
- d) Shed height to be kept minimum to achieve higher speeds.

Shri. Vivek Plawat suggested the following points:

- a) Metallurgical aspects need to be looked into to minimize the wear & tear of the cams. CMTI assured that this aspect has been studied and addressed elaborately in prototype loom development.
- b) CMTI to look into the possibility of deploying the Electro magnet based mechanism for weft insertion system.
- c) CMTI to aim at developing the machine with minimum breakages per hour, minimum weaving defects and reduced power consumption to make the machine competitive in the global market.

Dr. Selvaraj suggested the following points:

- a) Reliability of the shuttleless looms to be high
- b) Machine to be designed for an operating life of at least 8 to 10 years
- c) Cost of the machine should be competitive.

Prof. S. M. Ishtiaque, Chairman, PRMC, summarized the suggestions of PRMC members. He emphasized that if CMTI masters the art of developing three primary motions - Weft insertion, Shedding and Beating, the project is a great success. He also mentioned that Secondary motions, Higher weaving widths and Automation can be targeted later.

Networking & Collaboration

Prof. S. M. Ishtiaque, Chairman, PRMC, shared his experience of working with Czech universities and highlighted the leading role played by Technical University of Liberec (TUL), Czech Republic, in the field of textile machinery development. He highlighted that Textile Machinery Design & Development activities of Czech Republic, particularly TUL are commendable and recommended that a delegation may

visit the facility for learning & adaptation. He also suggested that CMTI can sign an MOU with TUL and other Czech organizations for Technology Development and Acquisition in textile machinery.

Shri. D. Yuvaraj suggested that other international Research institutes may be explored for collaborative Technology Development, if necessary.

Shri. Sanjay Chavre mentioned that acquisition of company involved in the development of loom and having specialized technologies, may be considered, if necessary. He suggested that machine should be made smart with data acquisition and monitoring devices. CMTI & TMMC informed that such advancements can be made with suitable add-on devices.

Centre of Excellence

Dr. K. Selvaraju suggested that considering the excellent work being carried out by CMTI in this project, a **"Centre of Excellence for Textile Machine Development"** may be setup at CMTI to address the needs of indigenous machinery development for textile industry.

Conclusion

Prof. S. M. Ishtiaque, Chairman, PRMC, appreciated the efforts of CMTI in developing the technologies for shuttleless loom and expressed his satisfaction over the progress made till date. He appreciated the participation of TMMC & TMMA in the development of hi-tech shuttleless loom.

Shri. Sanjay Chavre, requested Prof. S. M. Ishtiaque & CMTI to join the delegation to Czech Republic headed by Honorable Minister of Commerce & Industry, Smt. Nirmala Sitharaman. He thanked all the PRMC members for their active participation and valuable inputs and CMTI for praise worthy technical achievements. He acknowledged the key inputs from PRMC members for loom development.

The committee suggested CMTI to hold the next PRMC meeting by the end of September 2017.

After the meeting, PRMC members witnessed the following prototype loom development activities on test bench at CMTI:

- a) Demonstration of novel weft insertion mechanism developed by CMTI.
- b) Manufacturing process development of conjugate cams for beat-up mechanism.
- c) HMI development for dobby operation and weft color selection.
- d) Current status of manufactured parts & bought out items.

S. V. Mansur
Project Coordinator.