भारत सरकार Government Of India
रेल मंत्रालय Ministry Of Railways
(रेलवे बोर्ड) (Railway Board)

Minutes Of The Meeting Of
'Mission Implementation And Coordination Committee (MICC)'
To
"Technology Mission For Indian Railways (TMIR)"
Held at Railway Board, New Delhi on Thursday, 29th September, 2016

1. In terms of Railway Board's letter no. 2015/CE-I/INNOV/3/TMIR, dated 14.09.16; meeting of the 'Mission Implementation & Coordination Committee (MICC)' to the "Technology Mission for Indian Railways (TMIR)" was held on 29.09.2016 at Railway Board's office, New Delhi.

2. Following were the participants :

A.	**Members of The 'MICC' To 'Technology Mission For Indian Railways' (TMIR) :**		
(1)	Prof. N.S. Vyas, *Chairman*	*vyas.nalinaksh@gmail.com*	*9956292801*
(2)	Shri Alok Kumar, *Co-Chairman and C.E./NR*	*alokalokindia@rediffmail.com*	*9910487302*
(3)	Shri Shailendra N. Jaiswal, *ED/E&R/RB*	*eder@rb.railnet.gov.in*	*9910487329*
(4)	Dr. Kalpana Dube, *ED/Finance/RDSO*	*edfinrdso@gmail.com*	*9794863002*
(5)	Shri Vinay K. Agarwal, *ED/Research/RDSO*	*edresrdso@gmail.com*	*9794863022*
(6)	Dr. Neeraj Sharma, *Scientist(G) & Adviser/MoST*	*neerajs@nic.in*	*9810753972*
(7)	Shri Om Prakash Tantia, *Industry Member*	*tantiaom@gmail.com*	*9831008640*
(8)	Dr. Sunil Sherlekar, *Industry Member*	*sunil.d.sherlekar@gmail.com*	*9663090004*
B.	**Other Participants :**		
(9)	Shri Nasim Uddin, *ED/PS&EMU/RDSO*	*edpsemurdso@gmail.com*	*9794863016*
(10)	Shri Akhilesh Misra, *Dir./ME(C&IS)/RB*	*akhilesh.misra@gov.in*	*9717640768*
(11)	Shri Rishi Gangwar, *Dir./Res.(Civil)/RDSO*	*drcrdso@gmail.com*	*9794863280*
(12)	Shri Vineet Singhal, *Dir./Res./RDSO*	*dirssrdso@gmail.com*	*9794863129*
(13)	Shri Prashant Mishra, *Dir./PS&EMU/RDSO*	*prashantmishra@outlook.com*	*9794863258*
(14)	Prof. P.P. Chakrabarti, *Director/IIT/Kharagpur*	*director@iitkgp.ernet.in*	*9434013691*
(15)	Prof. Pallab Dasgupta, *IIT/Kharagpur*	*pallab@cse.iitkgp.ernet.in*	*9434016141*
(16)	Prof. Raja Datta, *IIT/Kharagpur*	*rajadatta@ece.iitkgp.ernet.in*	*9474065905*
(17)	Prof. Ashish K. Darpe, *IIT/Delhi*	*akdarpe@mech.iitd.ac.in*	*9911112446*
(18)	Prof. S.P. Singh, *IIT/Delhi*	*singhsp@mech.iitd.ac.in*	*9818287249*
(19)	Prof. K. Gupta, *IIT/Delhi*	*kgupta@mech.iitd.ac.in*	*9999910360*
(20)	Prof. Bharadwaj Amrutur, *IISc./Bangalore*	*amrutur@gmail.com*	*9886054723*
(21)	Shri B.M. Shukla, IIT/Kanpur	*bms@iitk.ac.in*	*9935509512*

3. Shri Alok Kumar, Co-Chairman/TMIR extended a warm welcome to the Mission Chairman, Members of the 'MICC' and all the participants of the meeting.

4. Co-Chairman informed that the Mission Management Manual (MMM) to the Technology Mission for Indian Railways (TMIR) has been approved by Railway Board. He informed that while approving the MMM; CRB has also advised to ensure Joint Funding as per Para VI of MMM before committing any expenditure.

In this connection, Co-Chairman apprised MICC about the outcome of meetings held with other Ministries in this regard. MHRD and DST have already committed for funding the TMIR projects, as per their shares in the projects and as also mentioned in the MMM. There needs to be follow-up and to get confirmation from these Ministries for release of funds to TMIR projects.

It was opined by MICC that with the continued concerted efforts for funding from MHRD and DST, as also advised by Board; MICC may go ahead with the already sanctioned projects and fund, as already approved by MICC, may be released from TMIR, so that these projects may progress.

Prof. N.S. Vyas, Chairman/TMIR was also requested to get the MMM for 'TMIR' printed, as was earlier done for 'TMRS'; so that it may be made available to all concerned.

5. Discussion on Projects :

5.1 Digital Train Communication :

Subsequent to discussion on this project proposal in meeting of TMIR on 9th Mar and further meetings with IIT/KGP on 18th May & 24th Oct, following presentations were made :

5.1.1 Train Communication Networks - Presented by Shri Nasim Uddin, ED/PS&EMU.

- An overview of the present technologies developed & available/deployed in EMUs on Indian Railways and Metro Systems was presented. The technology for train communication system has been provided by the manufacturers of propulsion systems.
- "Train Control and Monitoring system (TCMS)" is the application where TCN is presently used on EMUs and Metro Rolling stock. This involves interface with propulsion equipment (Traction and Auxiliary converters), PIS/PA systems, Door control units, HVAC control unit. Thus, compatibility issues of TCN/TCMS are proposed to be developed by IR/IIT with other sub systems and its acceptance by other vendors needs to be examined.
- For main line passenger trains, the issue of uniform couplers for all types of passenger coaches and different locomotives, is also to be addressed.

5.1.2 Digital Train Communication Network for Indian Railways (Enabling Digital Train Technologies) - Presented By Prof. P.P Chakrabarti, Director/IIT/Kharagpur

- Outlined the emerging landscape of digital train technologies in India and brought out why DTCN should be at the focal point of ICT roadmap of Indian railways.
- Emphasized preparing IR's technology roadmap for creating digital train communication networks by integrating multi-vendor components.
- Developing a framework for designing reconfigurable, scalable and optimized network solutions for supporting custom combinations of features, including those for passenger safety, comfort, train health monitoring, infotainment and train control.

- Stages of the proposed project :
  - Technology assessment and requirement analysis
  - Development of digital workbench for design prototyping
  - Development of solution architectures
  - Pilot deployment and standardization

5.1.3 Presentation on DTCN was also given by Shri Akhilesh Mishra, Director/C&IS/RB, outlining the goals and standards of the technologies and stake holders from Railways and Industries.

5.2 <u>Inter-operability between different makes of Distributed Power Control Systems (DPCS) for running of Heavy Haul Trains</u> :

Subsequent to discussions on this project in TMIR meeting on 16th Nov '15 and meeting of Prof. Amrutur Bharadwaj of IISc./Bengaluru with RDSO on 14th Dec '15, presentation was made by Prof. Bharadwaj, explaining the scope of work as under :

- To study existing solutions and standardization efforts
- To develop specifications for radio protocol for this application
- To develop prototype implementations of the specs.
- Experimental validation under various conditions
- Make the work (report, software etc.) available for railways to take it further

5.3 <u>Development of suitable technology to Detect Rail Fracture and its Communication to the Driver of an Approaching Train and Central Control</u> :

Subsequent to discussions on this project in TMIR meeting on 16th Nov '15 and meeting of ED/Track/RDSO with Prof. Ananth Ramaswamy of IISc./Bengaluru, presentation on Rail Health Monitoring via FBG and Ultrasound Sensors was given by Prof. Amrutur Bharadwaj during the meeting, explaining scope of work as under :

- Design of FBG Sensor system for rail health monitoring
- Design of Ultra sound sensor system
- Prototype FBG Sensor implementation
- Prototype Ultra sound implementation
- Test in IISc. and Railway Test Facility

5.4 <u>On Board Diagnostics</u> :

Subsequent to discussions on this project in TMIR meeting of 9th Mar '16, the developments were presented by Dr. Ashish K Darpe, IIT/Delhi. Detailed consultations have also been held with TCS, with two options for hardware : Integrated Wireless Sensor & Digital Vibe Sensor. Further work will be done by RDSO with these institutions for formulating the project and presentation to MICC.

5.5 <u>Unified ID Scheme and GIS Mapping for IR Asset Management & Route Profiling</u> :

Presentation was made by Shri B.M. Shukla from IIT/Kanpur. It was informed by DME/C&IS that project on GIS mapping has already been sanctioned by RB and it has been started by Engg. Deptt. through CRIS. RDSO would apprise further after discussions with Board and CRIS.

5.6 **Design of Advanced Performance Track Friendly Freight Bogies alongwith Wagon** :

As per decision taken in TMIR meeting held on 9th March '16, sanction was accorded by MICC for discussions with foreign universities & agencies for formulating the R&D plan and collaborative engagement at a cost of Rs.15 lacs. Prof. NS Vyas, Chairman/TMIR mentioned about his technical discussions with concerned Professors in Sweden and brought out :

(i) Two Professors from KTH/Sweden shall come to India for detailed discussions with RDSO. Prof. Uday Kumar of Lulea Technical University and a Professor from Chalmers University, Sweden may also join. They will bear their own travel expenses. However, it was felt that their lodging & boarding in India should be taken care of by MICC. It was agreed that expenditure on this account shall be met out of "MICo" project of IIT/Kanpur.

(ii) Broad components of this project, in association with RDSO, would tentatively be :

(a) Rail wheel interaction to be handled by Chalmers University/Sweden and IIT/Kanpur

(b) Complete wagon design (including bogie) to be handled by KTH/Sweden and IIT/Kanpur

(c) RAMS parts to be handled by Lulea Technical University/Sweden and IIT/Kanpur

(d) Fabrication of two wagons to be done in India

5.7 **Development of Capability for Testing of High Speed Rolling Stock** :

As per decision taken in TMIR meeting held on 9th March'16 sanction was accorded by MICC for discussions with foreign universities & agencies for formulating the R&D plan and collaborative engagement at a cost of Rs.15 lacs. Prof. NS Vyas, Chairman/TMIR mentioned that some Italian Firms are working on the similar technologies, as required by RDSO. Discussions were proposed to be held with these firms alongwith suitable academic institutions.

6. For meeting the administrative & other overhead expenditure, a Project - *"Mission Implementation & Co-ordination (MICo)"* at a cost of Rs. 5 lacs was sanctioned by MICC for IIT/Kanpur, to be operated by Chairman/TMIR, in accordance with the procedures of IIT/Kanpur. Considering the expenditure status of this fund, an additional transfer of Rs. 15 lacs to meet further prospective expenditure was sanctioned by MICC. RDSO would transfer the money to 'MICo' accordingly.

7. ED/Res./RDSO mentioned about a project proposal, costing Rs. 7.5 crore for infrastructural facilities for TMIR activities at RDSO. MICC desired that RDSO should properly formulate proposal as per provisions of MMM for consideration and sanction by MICC under TMIR.

8. **Interactive Session with officers of Northern Railway at Baroda House :**

8.1 It was considered appropriate by MICC to have interaction with the Zonal Railways and get real situation ideas for formulating research projects from users' perspective.

Accordingly, Interactive Session was planned with GM and PHODs of Northern Railway at Baroda House. Due to other engagements of GM, the meeting was attended by AGM, FA&CAO, CRSE/Chg., CTE, CE/Cons., CCM/PM, CTPM, CCE etc.

8.2 Concept of TMIR was shared by Co-Chairman/TMIR and Chairman/TMIR explained the present R&D Ecosystem and purpose of TMIR. It was also apprised that an interactive web page on TMIR is under preparation on RDSO's website, wherein various ideas & suggestions for projects to be undertaken through TMIR and status of on-going projects would be readily available.

8.3 Followings suggestions were given by Northern Railway officers during meeting :

(i) A standardized accounting system for Indian Railways

(ii) A high speed UFSD system for carrying out ultrasonic testing of rails

(iii) Cleanliness and hygiene standards for coaches

(iv) Facility of knowing status of availability of berths in different classes. e.g. Tatkaal, Non-Tatkaal, etc. in passenger reservation system

(v) Robust touch screens for ticket vending machines to avoid damages

(vi) Facility for selection of berths in coaches while making reservation

(vii) Computerization of all records at stations and linking with Divisional Hqrs.

(viii) User friendly and maintenance-free new systems to be designed

(ix) Facility of tracking of all train movements on real time basis

(x) Algorithm for choosing the optimized route for speedy movement of freight trains

(xi) Software for optimum utilization of rolling stock

8.4 AGM/NR was requested that one-page concept note for each of the idea/proposal to be prepared by NR and to be given to Co-Chairman/TMIR by 20.10.2016; so that the respective project proposals may be formulated by the concerned Directores of RDSO and may be processed for sanction in terms of provisions of Mission Management Manual of TMIR.

(No. 2015/CE-I/INNOV/3/TMIR, New Delhi, Dated 07.10.2016)

07/10/16

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Distribution :

- Director General, RDSO, Lucknow and General Manager & AGM, Northern Railway, New Delhi
- Chairman and all the Members of MICC to 'TMIR' (Technology Mission For Indian Railways)
- All the participants of the meeting.

Copy to :

- EDPG/MR and PS/MR for kind information of Hon'ble MR please
- PS/MSR(S) and PS//MSR(G) for kind information of Hon'ble MSR(S) and Hon'ble MSR(G) please
- PSO/Sr.PPS to CRB, ME, FC, MRS, MTR, MT, MS and Secretary for kind information of CRB, ME, FC, MRS, MTR, MT, MS and Secretary please
- The Secretary, Ministry of Science & Technology and Secretary, Ministry of HRD, New Delhi for information please