Memorandum of Understanding

This Memorandum of Understanding signed on the 13th day of February, 2010

BETWEEN

MINISTRY OF RAILWAYS, GOVERNMENT OF INDIA

&

INDIAN INSTITUTE OF TECHNOLOGY, KHARAGPUR

hereinafter collectively called as "Parties"

WHEREAS

Ministry of Railways is operating one of the largest railway systems in the world. Its countrywide network of approximately 64000 kms carries over 6524 million passengers per annum and moves 875 million tonnes of freight traffic. With the growth in Indian economy, Indian Railways transport business is expected to grow at an average rate of 10% per annum over the next ten years. To achieve this phenomenal growth Indian Railways considers it necessary to make use of the technological advancements in the field of Railway technology, as technology plays a major role not only in improving the quality of service but also in productive utilisation of the rail infrastructure and reducing costs. Indian Railways which at present is an importer of technology intends to develop cutting edge indigenous technologies and turn a net exporter of technology by 2020.

Indian Institute of Technology, Kharagpur is a premier educational and research institution of the country. Other than providing modern technical education in the country, the Institute pursues cutting-edge scientific and industrial research in almost all branches of engineering sciences. The institute has worked hand in hand with top industrial and government organisations to set up strategic research laboratories and missions for development of next generation technologies.

The Parties are part of Government of India and have expressed their desire to work together towards developing next generation railway technology.

NOW THEREFORE, IN CONSIDERATION OF THE FOREGOING PREMISES, THE PARTIES MUTUALLY AGREE TO CO-OPERATE AND COLLABORATE AS UNDER:

a. In order to develop a long-term frame work for research collaboration a Centre for Railway Research (CRR) will be set up at IIT Kharagpur.

b. **Parties** will set-up an APEX STEERING COMMITTEE consisting of senior officials, faculty members and experts of the Parties.

c. The Centre for Railway Research shall carry out research related to the following areas:
   - Heavy Haul Technology
   - Vehicle Dynamics

D Acharya

- High-Speed Technologies
- Energy Efficient Traction Power Supply Systems
- Track Research
- Use of Artificial Intelligence for Predictive Maintenance and Management.
- Material Sciences for Railway related Composites including Rubbers, Polymers and Insulation Materials.
- Development of Integrated / Embedded Processors for Railway Applications
- Applications for Access Control, Security and Safety including Biometrics
- Open Platform Propulsion Control Systems for Rail Vehicles
- Non Conventional Drives and Technology including Maglev, L.I.M.
- Remote Sensing and Measurement of OHE, Track and Signals

More areas may be identified later.

d. A Program Advisory Committee (PAC), comprising of officers from Indian Railways and faculty members of IIT Kharagpur will be formed. The exact composition of PAC will be based on the recommendation of the APEX STEERING COMMITTEE. PAC will administer, monitor and supervise all the R&D related activities coming under this MOU.

e. A multi-disciplinary approach would be adopted for carrying out the research. The Centre for Railway

Research will form research programme groups in each field comprising Professors and faculty members from IIT Kharagpur along with officers from Railways.

f. Experts working in the Centre for Railway Research will be given specialised training in Railway technology in India and abroad.

g. The Centre for Railway Research will offer PhD programmes in research areas related to Railways and will also involve IIT B. Tech and M. Tech students in Research projects and offer course electives related to Railway technology.

h. Railway officers will be sent on deputation at the Centre for Railway Research for participating in the research and development work as well as for short-term and long-term training programmes.

i. RDSO will constantly interact with the Centre for Railway Research and facilitate transfer of technology. Indian Railways will identify officers for continuous interaction with these research groups on a long term basis.

j. To implement this MOU, Indian Railways will provide grants in aid to the Centre for Railway Research. Parties would mutually decide the modalities of funding and execution of this MOU based on recommendations of the APEX STEERING COMMITTEE.

D Acharya

k. Policy and guidelines regarding Intellectual Property Rights will be mutually decided by the Parties.

l. The MOU will be operative from 13.02.2010 and any alteration/modification may be carried out with the consent of both parties.

The Parties hereto, have caused this MOU to be signed in their respective names as on the day and year first above written.

For and on behalf of Ministry of Railways, Government of India	For and on behalf of IIT, Kharagpur
A.K.Goyal Member Staff, Ex-Officio Secretary to Govt. of India Ministry of Railways, Government of India Date:- 13.02.2010	Prof D. Acharya Director Indian Institute of Technology, Kharagpur Date:- 13.02.2010

WITNESS:

1. DG/RDSO

2. ED/EER, Rly Board.

1. Dean SRIC

2. Dean PGS&R