



Garvita

NEWS BULLETIN

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Message from Chairman, Rly. Board



It gives me immense pleasure to learn that the Institution of Railway Electrical Engineers (IREE) brings a News Letter on various developments and achievements in Electrical Department on auspicious day when the Electric Traction was introduced on IR for the 1st time on 3rd Feb, 1925.

The role of Electrical Engineers on Indian Railways has grown many folds since the induction of 1st Electric Train in 1925. Also, IR is witnessing administrative and technological reforms during recent years. This has put up greater responsibility on the shoulders of Electrical Engineers to deliver.

All above things are possible only when we strengthen our design, manufacturing and execution capabilities and also develop high quality maintenance practices for electric & diesel locomotives and other assets which can make India a hub for manufacturing high HP, high speed locomotives and train sets. These areas offer great opportunities and challenges for our highly motivated team of young Electrical Engineers of IR.

Lastly, I once again congratulate the organisation of IREE for bringing out this News Letter which I believe has become a connecting thread for all Electrical Engineers of IR, those serving and also my seniors who had pioneered and nurtured this wing of IR and brought it to this level.

(V. K. Yadav)

Chairman & ex-officio Principal Secretary to Govt. of India, Railway Board

From the Desk of Patron



At the outset, I would like to congratulate team IREE for bringing out the 7th edition of Magazine "Garvita" on the 8th IRSEE day highlighting the achievements of Electrical Department of Indian Railways. Further, it gives me immense pleasure to share that IR is working on Mission 100% electrification of Indian Railways by 2021-22 which would make Indian Railways the world leader for being 1st

Railways in the world to achieve this milestone. Achieving this mammoth target is a challenge and requires an in-depth analysis and refinement of all the processes to fasten execution.

On 4th Sep.'18, IREE organised an International conference on E-mobility in Indian Railways. The main objective of the one day International Conference was to bring project developers and other stakeholders on a common platform for making Indian Railways (IR) an efficient, preferred and greener mode of transport.

Lastly, I once again congratulate the organization of IREE which I believe has become a connecting thread for all Electrical Engineers of IR, those serving and also my seniors who pioneered and nurtured this wing of IR and brought it to this level.

(Ghanshyam Singh)

Patron, IREE and Member Traction & ex-officio Secretary to Govt. of India, Rly. Board

Foreword



I am pleased to know that on the occasion of Electrical Engineers Day, IREE is publishing 7th volume of News Letter 'Garvita' bringing out various activities and initiatives undertaken by them. IREE's contribution in the growing role of Electrical Engineers in Indian Railways is highly appreciable & this News Letter will be another milestone in the process.

Presently 52% of total route KMs of Indian Railways have already been electrified and further commitment for 100% electrification by 2021-22; the role of Electrical Engineers in overall working of Railways has grown tremendously. With addition of operation and maintenance of Diesel Locomotives under its fold, Electrical Engineers on Indian Railways now manage logistics and operation of more than 10,000 electric/diesel locomotives pan India basis. Recent historic decision of 100% electrification leading to foreign exchange saving, carbon emission reduction and contribution in overall growth and prosperity of the Nation brings Railway Electrical Engineers in forefront of Railway working.

With growing Role, there comes responsibility to preserve the values and inculcate new ideas, which I am sure that IREE through its various initiatives is taking forward. Towards the end, I once again convey my best wishes to IREE for bringing out this edition of News Letter. I am quite sure that this will rightly spread the message of progress and growth of Electrical Department on Indian Railways.

(Manju Gupta)

President, IREE and Addl. Member Electrical, Railway Board

From the Desk of General Secretary



On the occasion of 8th Railway Electrical Engineers Day being celebrated on 3rd February, 2019 by IREE, 7th Volume of 'Garvita' News Bulletin is being brought out as an Endeavour of IREE to disseminate and share the technical knowledge among the railwaymen. Efforts have been made in this edition to highlight the achievements of Electrical Deptt. which has come a long way

due to tireless efforts and commitment by Electrical Engineers of Indian Railways to serve the organization. Electrical Deptt. has a vital role to play in the increased expectations of Indian Railways customers. This year was a glorious year for IREE under the able guidance of the patron of IREE, Sh. Ghanshyam Singh, Member Traction and many technical seminars were organized in collaboration with other technical bodies like IE, IEEE & IET. International Conference on 'E-mobility in Indian Railways' on 4th September, 2018 deserves special mention, which was widely appreciated. I look forward towards each and every member of Electrical Deptt. for active support in patronizing this news bulletin to keep each of us updated.

(S. K. Singh)

General Secretary, IREE & Pr. Chief Electrical Engineer, Northern Railway

Achievements of Electrical Department

Electrical Energy Management & Green Initiatives on IR - Policy directives

- "Vision 2020" document of Indian Railways envisages sourcing at least 10% of energy used from renewable sources such as solar power and wind power and saving up to 15% of energy through improved energy efficient appliances.
- To improve efficiency and to explore alternate sources of energy, Indian Railways have already taken a large number of steps & measures for Energy Conservation and Renewable Energy including framing of policy directives specially for level crossing gates, remote railway stations, provision of solar street lights, provision of solar water heaters etc.

Initiatives of harnessing renewable energy on IR

- **Solar Power plant over NR**
 - 11,281 kWp (including 8226 kWp PPP Model) Solar Power Plants over Northern Railway commissioned till date.
 - Total 164.29 Lakh units (against 11281 kWp) are expected to be generated from these plants annually.
 - Saving of Rs. 999.72 Lakh/annum (expected).
 - Reduction of 13471.78 ton CO₂ equiv. per annum.



New Delhi

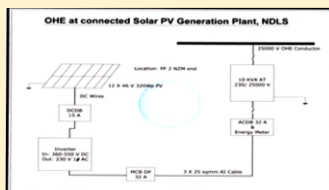


H. Nizamuddin

- **Solar power plant at Sahibabad Railway Station**
 - 16 kWp with grid connected solar plant installed.
 - Dual Purpose: in generation of electricity for its own requirement & also provide shelter on platform no-1 from rain and sun.
 - Total 0.23 Lakh units are expected to be generated.
 - Saving of Rs. 1.81 Lakh per annum (expected).



- **Solar panel to feed in 25 kV OHE**
 - First time in history of Indian Railways 5 kW solar Plant installed successfully to feed 25 kV OHE.
 - Installed at Platforms No. 2/3 of New Delhi Railway station.



- **Provision of LED Lighting**
 - Northern Railway achieved target of 100% LED lighting in all 930 electrified Railway stations, station buildings & service buildings.

- Total of 92,726 fittings replaced to energy efficient LED lights fittings
- The estimated energy saving come to 12.93 MU, to the tune of Rs. 10.36 Crores per annum.
- Reduction of 10,610 tonnage of CO₂ per annum.



Railway Electrification

More than 4087 RKMs of electrification has been completed during the year 2017-18. Electrification of 30,212 RKMs has been completed over IR upto March, 2018. Further, 2033 RKMs of electrification has been completed during the year 2018-19 upto 31.12.2018 taking total electrification of 32,245 RKMs over IR upto December, 2018.

Improving Operating Ratio-Reducing Electric Traction Bill: through Open Access

IR has been granted the status of Deemed Licensee under third proviso to section 14 of Electricity Act 2003 & started to procure power through Open Access directly from Generating Companies through tariff based bidding/bilateral arrangements. Accordingly, Mission 41K was envisaged for Traction Energy Cost Optimization Conceptualizing Savings of Rs 41,000 Cr. from 2015 to 2025.

On 26th Nov, 2015, IR dream was realized when it started drawing approx. 200 MW power on CR from RGPPL in Maharashtra. Against total requirement of about 2000 MW, currently approx 1100 MW power is flowing under open access in the states of M.P., Maharashtra, Gujarat, Jharkhand, Rajasthan, Haryana, Karnataka, Delhi, Bihar, UP & DVC area Total Savings till Oct' 18 is approx Rs 9209 Cr. against proportionate target of Rs.7942 Cr.(about 16% more) as envisaged in "Mission 41K."

Air conditioned EMU rake

First air conditioned EMU rake manufactured by ICF with indigenous propulsion system started its commercial services successfully from 25th Dec'17. Further, 6 more air conditioned EMU rakes are likely to be inducted during 2018-19.



3 Phase On Board MEMU rakes

Five MEMU of 8 car equipped with 3 phase On Board electrics turned out from ICF. Out of 2 prototype rakes trial of one MEMU rake has already been completed & will be introduced shortly in SECR.

3 phase underslung MEMU rakes

One MEMU rake of 8 car with underslung 3 phase electric has been turned from ICF and under trial with RDSO.



E vehicle charging

- Rajasthan Electronics & Instruments Limited (REIL), proposed 20 DC fast charging station for E-vehicles.
- E-Vehicle charging stations are commissioned at Anand Vihar Terminal, New Delhi, Old Delhi Railway stations & Railway Board.
- 40 Nos. E-vehicles can be charged at a time from this facility.
- Environment-friendly step in the highly polluted area of Delhi-NCR.
- Reduction in carbon footprint from the operating vehicles



Use of Solar Power in passenger coaches (Green Initiative)

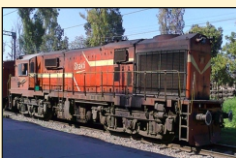
Existing train lighting in coaches is catered through SG/EOG system, which envisages generating equipment requiring high maintenance and consumption of fossil fuel.



Keeping in line with aspiration & sensitivity to reduce carbon foot prints, solar panels are being provided on the roof top of non AC coaches under trial by M/s CEL. 13 coaches (one rake) of train no. 54076/75/85/86 Sitapur-Delhi-Rewari Passenger train have been provided with such solar panels during the during 2018-19 for technology demonstration. Earlier, 19 NG coaches of Kangra Valley & KLK-Shimla section were installed with Solar panels during 2011-12.

First in the world – A Make in India initiative

Conversion of Alco Diesel Locomotives to Electric Locomotive: Two 2600 hp Alco diesel locos (WDG3A locos) have been successfully converted to form twin WAGC3 locos with a horse power of 10000 hp. This loco delivers 92% more rail horse power as compared to older version of Diesel locomotives. The Cost of conversion was half of the cost otherwise required for undertaking Mid-term rehabilitation of the old diesel locos to keep them in service. After successful trials and sanction of Railway Board, the first twin WAGC3 loco no. 10001 has been introduced in revenue service. This is an efficient use of the diesel locomotives which are losing utility after large scale electrification. Further conversion of 200 WDG3A locos, which have residual life, is planned.



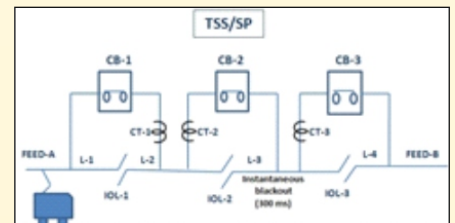
Electronic display in Lobbies for e-learning

Electric Loco Training Centre, S.E. Railway TATA is issuing instruction/remedial action in PPT form by collecting failure report of locomotives from each Division of S. E. Railway. It makes a case study to issue instruction/remedial action in Audio-visual form to be displayed in every lobby of SER, to avoid recurrence of similar failure in future. Each lobby is equipped with a large size electronic display on which this material is displayed through a pen-drive. The same display is used to display e-Gradients and e-Caution Order by time sharing for the benefit of crew. It reduces number of manual boards in Lobbies. The changes are easy to implement in electronic form.



Automatic Switch Neutral Section -ASNS

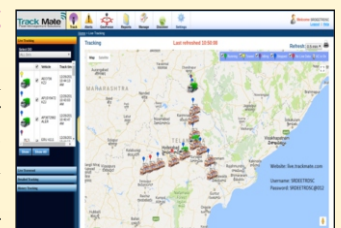
Indian Railway has decided to run trains at 160/200 KMPH under 'Mission Raftar'. For introducing high speed trains, the spacing between TSS shall



be reduced and observing of DJ on/off signal boards by Loco Pilots will become major constraint. To overcome this problem RDSO have developed the Automatic Phase Switch Controller to be installed at the TSS/SP locations by which there will not be any requirement for switching on/off DJ at Neutral Section. Northern railway has successfully completed the trial of Directional Current Control (DCC) based ASNS at Asaudah TSS in Delhi division recently.

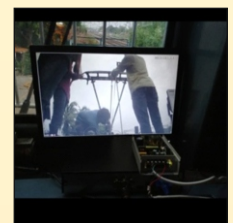
Tower car Live Tracking System

A tower car tracking system was installed on all 20 tower cars and 4 road vehicles in SC Division to monitor their real time position through GPS and existing Google maps for easy tracking during block/breakdown periods. This system includes a web based centralized monitoring, history tracking and also automatic report generation for each vehicle based on the requirement.



Remote stager checking system in Tower Car

A CCTV system for observation and recording of contact wire stager was installed in Moula Ali Tower Car ERU 4071 on 07.06.2018. This system allows for live monitoring of contact wire stager from the tower car's driver cabin itself. This system also allows for recording of the live line checking done for access at a later time. The main parts of the system are "Night Vision Camera", DVR, Monitor and Power Supply.



Highlights of International Conference on E-mobility in Indian Railways held on 4th September, 2018

Minister of State for Railways & Minister of State for Communications (Independent Charge) Shri Manoj Sinha inaugurated the International Conference on E-mobility in Indian Railways organized by Institution of Railway Electrical Engineers (IREE) in partnership with Niti Aayog, REMCL & IRCON. Shri Amitabh Kant, CEO, NITI Aayog, Shri Ashwani Lohani, Chairman, Railway Board & Principal Secretary to Govt. of India were specially present to grace the occasion. Shri Ghanshyam Singh, Patron, IREE & Member Traction, Railway Board, other Railway Board Members and senior officials were also present on the occasion.

Speaking on the occasion, Shri Manoj Sinha said, Ministry of Railways has decided to accelerate the pace of electrification and adopt EPC mode of tendering for RE projects. He has stated that after the proposed electrification of Railway lines, Rs. 13,000 crore per annum could be saved in fuel bill and also reduce the carbon emissions by around 3.4 million tonnes per annum.

He has stated that the actual savings due to initiatives in energy procurement has so far been Rs. 7504 crore, higher than as envisaged in Mission 41k. He has also stated that Indian Railways should increase their solar power target and has to lead this segment in the country and also go with the vision of Hon'ble Prime Minister's Clean and Green energy. He has stated that Indian Railways should look into the options of Ethanol blending. He has hoped that this seminar would bring

out new ideas and initiatives to make Indian Railways more efficient, preferred and greener mode of transport and also enable Indian Railways become a growth engine in the economic development of the nation.

Chairman, Railway Board Shri Ashwani Lohani stated that electrification of Railway lines has been identified as one of the major potential area for reducing the expenditure of Indian Railways.

Member Traction, Railway Board Shri Ghanshyam Singh said that Indian Railways has achieved the highest ever electrification of 4087 RKM during 2017-18 and has planned to increase this execution capacity further. He has stated that to face the challenges posed by the accelerated electrification in terms of availability of electric locomotives and utilisation of diesel locomotives, the in-house production of electric locomotives has been increased and the first in the world initiative of conversion of diesel locomotives to electric locomotives has been undertaken. More than this conversion, the converted electric locomotive will have 92% more power as compared to the diesel locomotive. He stated that by adoption of LEDs, renewable energy and open access in non-traction areas, annual saving of around Rs. 1100 Crore is envisaged. He hoped that this conference shall bring out some innovative ways to be employed in railway electrification field, latest available technology for electrification, Rolling stock and energy storage systems.



IREE GOVERNING BODY

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Smt. Manju Gupta
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Organising Secretary
Shri R.N. Rajpoot,
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