

GOVERNMENT OF INDIA
MINISTRY OF COAL

RAJYA SABHA
UNSTARRED QUESTION NO 666
TO BE ANSWERED ON 10.02.2025

5G use case test lab in Mines

666 # Shri Aditya Prasad:
Shri Madan Rathore:
Shri Baburam Nishad:

Will the Minister of Coal be pleased to state:

- (a) the specific technologies and infrastructure used in the 5G lab to stimulate the mining environment, the details thereof, especially w.r.t. Jharkhand;
- (b) the manner in which the 5G lab will aid the Central Mine Planning and Design Institute's (CMPDI) core service of environmental monitoring, to make mining operations more eco-friendly, the details thereof, especially w.r.t. Jharkhand; and
- (c) whether training programmes or workshops can be conducted for coal industry professionals to familiarize them with the new technologies being tested, if so, the details thereof, especially w.r.t. Jharkhand?

ANSWER
MINISTER OF COAL AND MINES
(SHRI G. KISHAN REDDY)

(a): A 5G Centre of Excellence (COE) Use Case Test Lab along with development of different 5G Use cases/applications for Coal Industry has been established. The 5G Private Network setup in Centre of Excellence consists of 5G Radio and SA Core with integrated Mobile Edge Computing, IMS, 5G enabled IOT devices and Enterprise IT/OT application. The 5G Private Network setup in Centre of Excellence has following 5G infrastructure components:

- (i) Server for 5G Core
- (ii) Radio(CU/DU)
- (iii) IMS and MEC Platform for hosting of use case application
- (iv) 5G Indoor Radio along with Router/Switch and other accessories.
- (v) 5G IOT Devices
- (vi) 5G Use cases under development and Testing at 5G COE Lab are:

- I. 5G Based AI Camera
- II. 5G Based Drones
- III. 5G Based Fuel Management System
- IV. 5G Based Environmental Monitoring system

The 5G Centre of Excellence (COE) Lab envisages development of mines specific use cases by establishing 5G Captive Non-Public Networks (CNPN) for the mines of CIL subsidiaries viz. Bharat Coking Coal Limited(BCCL), Eastern Coalfield Limited(ECL) and Central Coalfields Limited(CCL). which are situated in state of Jharkhand.

(b): For ambient environment monitoring:

(i) For work zone environment, the 5G COE Lab established in CMPDI has a dedicated 5G Based Environmental Monitoring System Use Case in which 5G Based Environmental sensors has been developed to monitor environmental conditions namely CO₂, Temperature, Air Pressure and Humidity.

(ii) 5G Based Environmental sensors facilitate real-time environmental data transmission to cloud platforms/local servers and control room for real time monitoring of environmental condition of location desired and subsequent analysis.

(iii) The 5G Centre of Excellence(COE) Lab has also planned to develop mines specific environmental related use cases by establishing 5G Captive Non-Public Networks (CNPN) for the mines of CIL subsidiaries viz. Bharat Coking Coal Limited (BCCL), Eastern Coalfield Limited(ECL) and Central Coalfields Limited(CCL), which are situated in the State of Jharkhand.

(c): CMPDI in collaboration with M/s Telecommunications Consultants India Ltd., New Delhi (TCIL) and IIT, Ranchi shall conduct training programs/ workshops for Coal industry professionals and other stakeholders to familiarize them with 5G new technologies to be implemented in coal mining including 5G Infrastructure Design and Architecture, 5G Captive Non-Public Networks (CNPN), Various Software Module related to 5G network, 5G Configuration of Networks and Devices, Development of various 5G Based Use Cases and Operation & Maintenance of 5G Private Network/Devices. Premier Technical Institutes of Jharkhand shall also be familiarized with the new 5G technologies.
