

GOVERNMENT OF INDIA  
MINISTRY OF POWER

**RAJYA SABHA**  
**UNSTARRED QUESTION NO.1906**  
**ANSWERED ON 19.12.2023**

**MODERN AND SMART POWER TRANSMISSION SYSTEM**

**1906 SHRI S NIRANJAN REDDY:**

Will the Minister of **POWER** be pleased to state:

- (a) the steps taken by Government to implement the recommendations of recent Task Force Report on modern and smart power transmission system;
- (b) whether there is a proposed timeline for implementation of short-term to medium-term recommendations (1-3 years) and long-term interventions (3-5 years);
- (c) steps taken by Government to establish fully automated, digitally controlled, fast responsive grid, resilient to cyber attacks and natural disasters;
- (d) whether, predictive maintenance technique, using Artificial Intelligence (AI) and Machine Learning (ML) is being currently used in the transmission system to strengthen the grid; and
- (e) if so, number of substations that currently use AI/ML systems in the country?

**A N S W E R**

THE MINISTER OF POWER AND NEW & RENEWABLE ENERGY

(SHRI R.K. SINGH)

**(a):** Since April 2014, significant enhancements have transformed India's electricity transmission network. We have augmented the line length by 1.9 lakh circuit kilometers (ckm), bringing the total to 4.8 lakh ckm. Simultaneously, the transformation capacity has surged by 683 gigavolt-amperes (GVA), reaching 1213 GVA. The whole nation is now seamlessly connected into a single grid. This unified grid today has an inter-regional capacity of 116 GW to transfer power from one corner of the country to another, all while maintaining a consistent frequency. India's electric grid is today the largest synchronized grid in the world.

A Task Force has been constituted by the Ministry of Power in September, 2021 under the chairmanship of Chairman and Managing Director, POWERGRID to suggest ways for modernization of transmission sector and making it smart & future ready. The other members of the Task Force included representatives from State Transmission Utilities, Central Electricity Authority, Central Transmission Utility, Ministry of Electronics and Information Technology, Indian Institute of Technology Kanpur, National Smart Grid Project Management Unit (NSGPMU) and Electric Power Transmission Association (EPTA). The Task Force submitted its final report in February, 2023 to Ministry of Power.

Further, the Central Electricity Authority (Technical Standards for Construction of Electrical Plants and Electric Lines) Regulations, 2022 provides for the adoption of latest technologies.

**(b) :** The report includes suggestions on way forward for making the transmission system modern and smart.

**(c) :** The following steps, *inter-alia*, have been taken:

- Control Centres have been set up to remotely monitor and operate Extra High Voltage (EHV) substations, towards the establishment of an automated and digitally controlled grid.
- Computer Security Incident Response Team in Power Sector (CSIRT-Power) has been notified for managing the cyber security incidents in Power Sector.
- Communication System in Power Sector has to be in compliance with "Central Electricity Authority (Cyber Security in Power Sector) Guidelines".
- Central Power Research Institute (CPRI) has established test facilities for cyber security.
- GIS mapping of substations and lines likely to be affected by natural disasters.

**(d) & (e) :** Artificial Intelligence (AI) / Machine Learning (ML) tools are being used for maintenance of transmission lines. All grid substations use sensors for measuring various parameters of power system to carry out predictive maintenance.

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