

**GOVERNMENT OF INDIA
MINISTRY OF POWER**

**LOK SABHA
UNSTARRED QUESTION NO.1975
ANSWERED ON 11.12.2025**

**INTEGRATION OF COAL-FIRED POWER PLANTS WITH RENEWABLE
ENERGY**

1975. SHRI DUSHYANT SINGH:

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

(a) whether any studies have been carried out on the long-term impact of reduced technical minimum load requirements on the lifespan and efficiency of the existing coal-fired power plants in light of the commendable Government initiatives to enhance the share of renewable energy in the India's total energy generation, if so, the details thereof;

(b) whether remedial measures are being considered by the Government to address such potential impacts, if so, the details thereof; and

(c) whether the Government has any plans to introduce or promote hybrid technologies that can integrate the existing coal-fired power plants with renewable energy sources to ensure optimum efficiency and consistent power supply, if so, the details thereof?

A N S W E R

THE MINISTER OF STATE IN THE MINISTRY OF POWER

(SHRI SHRIPAD NAIK)

(a): The Central Electricity Authority (CEA) has carried out various flexibility studies on the long-term impact of reduced technical minimum load requirement of the existing coal-fired Thermal Power Plants (TPPs), in association with Original Equipment Manufacturers

(OEMs) / National & International partners. These studies indicate that 40% Minimum Technical Load (MTL) operation result in accelerate wear of components (particularly rotating components) and also reduces life of key pressure-part along with their efficiency. This impacts the lifespan and efficiency in long-term as:

- **Efficiency degradation;**
- **Increase in creep-fatigue;**
- **Accelerated corrosion and erosion;**
- **Higher risk of fatigue-related failures;**
- **Increase in Equivalent Forced Outage Rate (EFOR);**
- **Increase in Gross Heat Rate;**
- **Higher auxiliary power consumption;**
- **Reduced combustion efficiency at low loads.**

(b): The CEA has prepared several remedial & mitigation measures to address such potential impacts on existing coal-fired plants from reduced technical minimum load (TML) / flexible operation. These measures aim to ensure operational safety, maintain flame stability & combustion quality, and minimize stress on boiler and turbine systems, thereby reducing equipment damage and efficiency losses at low load. The key measures include retrofits in the existing system as below:

- **Implementation of Automation**
- **Optimization of control systems**
- **Installation of scanner for proper flame detection**
- **Installation/ use of steam coil air-preheaters (APH)**
- **Improved condition monitoring of boiler, turbine etc.**
- **Optimisation of Auxiliaries**

Further, Generating Companies (GENCOs) have been advised to adopt unit-specific retrofits rather than a 'one-size-fits-all', taking into account plant age, design parameters, coal quality and vintage so as to limit undue stress on plant equipment during flexible operation.

(c): Ministry of Power has issued a comprehensive policy on 07.11.2025 for co-firing of 5-7% blend of bio-mass pellets [including torrefied charcoal made from Municipal Solid Waste (MSW)] in Coal Based Power Plants along with coal, after assessing the technical feasibility.