GOVERNMENT OF INDIA
CENTRAL ELECTRICITY AUTHORITY
(MINISTRY OF POWER)
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PUBLIC NOTICE

In accordance with the Section 177 of the Electricity Act, 2003, the Central Electricity Authority (CEA)**,** proposes to notify the **draft Central Electricity Authority (Flexible operation of thermal power plants) Regulations, 2022.** The proposed draft regulations are available on the CEA Website www.cea.nic.in for inviting public comments. The Regulations can also be inspected in the office of Chief Engineer (Legal), Sewa Bhawan (North Wing), Room No. 622, 6th Floor, R. K. Puram, New Delhi-110066 on any working day till **26th August, 2022** between 1100 hrs to 1600 hr**s.**

2. All the Stakeholders including the public are requested to send their comments on the draft regulations to Chief Engineer (Legal), Sewa Bhawan (North Wing), Room No. 622, 6th Floor, R. K. Puram, New Delhi-110066 by post or through e-mail (celegal-cea@gov.in) latest by **26th August, 2022.**

(Rakesh Goyal)
Secretary, CEA

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Government of India
Ministry of Power
Central Electricity Authority

New Delhi, , 2022

NOTIFICATION

File No. CEA-TH-17-13/4/2022-TETD Division - In exercise of the powers conferred by sub-section (2)(g) of Section 177 of the Electricity Act 2003, the Central Electricity Authority hereby makes the following Regulations namely:

1. Short Title and Commencement-(1) These Regulations may be called the Central Electricity Authority (Flexible operation of thermal power plants) Regulations, 2022.

(2) They shall come into force on the date of their publication in the Official Gazette.

2. Definitions- (1) In these Regulations, unless the context otherwise requires,

(a) "Act" means the Electricity Act, 2003;

(b) "Authority" means the Central Electricity Authority established under sub-section (2) of Section 70 of the Act;

(c) "Base load operation" means operation at maximum continuous rating (MCR) or its high fraction;

(d) "Boiler Maximum Continuous Rating (BMCR)" means the maximum steam output, the steam generator (boiler) can deliver continuously at rated parameters;

(e) "Cold start", in relation to steam turbine, means start up after a shut down period exceeding 72 hours (turbine metal temperatures below approximately 40% of their full load values);

(f) "Control load", in relation to coal or lignite based thermal generating units, means the lowest load at which the rated steam temperature can be maintained under auto control system;

(g) "Flexible operation" means the ability of thermal plant to adjust the net power fed into the grid as per the dispatch schedules where must run power plants like renewable energy sources are taking part in meeting grid load demand.

(h) “Hot start”, in relation to steam turbine, means start up after a shut down period of less than 10 hours (turbine metal temperatures approximately 80% of their full load values);

(i) “Maximum Continuous Rating (MCR)”,-in relation to coal or lignite based thermal generating units, means maximum continuous output at the generator terminals expressed in kilo volt ampere (kVA) (net of any external excitation power) as guaranteed by the manufacturer at the rated parameters;

(j) “Minimum Power Levels (MPL)” means the minimum output power at the generator terminals that the power plant can sustain continuously without oil support. It is expressed as percentage of maximum rated capacity.

(k) “Must run” status for a power plant means generation of power from such power plant should not be curtailed for factors other than on account of grid safety or safety of equipment or personnel.

(l) “Ramp rate” means the measurement of how quickly a power plant can change its output. It is calculated as the ratio of change in power output to time taken for such change in power output. It is expressed as percentage (of unit rating) per minute.

(m) “Retrofit” means modernization or upgradation of power plant components or subsystems.

(n) “Shut down” means total stoppage of power plant and production activities by cutting off in- coming power supply to the power plant.

(o) “Startup / shutdown time”, in relation to power plants means the time required to move from nonoperational state (cold, warm, hot state) to operational state and vice versa. It is expressed in minutes.

(p) “Sub-Critical Unit”, in relation to coal or lignite based thermal generating unit, means a unit designed for main steam pressure less than the critical pressure (225.56 kg/ cm^2) of water;

(q) “Super-Critical Unit”, in relation to coal or lignite based thermal generating unit, means a unit designed for main steam pressure more than the critical pressure (225.56 kg/cm^2) of water;

(r) “Thermal Power Plants (TPP)” means the ‘generating station’ as defined in the Act for generating electricity using fossil fuels such as coal, lignite, gas, liquid fuel or combination of these as its primary source of energy to generate electric power;

(s) “Ultra Super-Critical Unit”, in relation to coal or lignite based thermal generating unit means a supercritical unit with steam temperature of 600/600^{0}C or higher at turbine inlet;

(t) “Unit”, in relation to a coal or lignite based thermal generating station, means steam generator with interconnected steam turbine-generator and auxiliaries, operated as one single set or system to generate electric power;

(u) “Warm start”, in relation to steam turbine, means start up after a shut down period between 10 hours and 72 hours (turbine metal temperatures between approximately 40% and 80% of their full load values).

(2) words and expressions used but not defined in these Regulations shall have the meaning assigned to them in the Act.

3. **Applicability** - These Regulations shall apply to all coal and lignite based thermal power plants and load despatch centers.

4. **General Requirements** - (1) The Thermal Power Plants shall be suitably designed for full range of ambient and other environmental conditions prevailing at site.

(2) The various parts or components or assemblies of equipment and systems shall be of proven materials with established physical and chemical properties appropriate to the service as intended.

(3) All equipment and systems installed shall comply with the provisions of statutes, Regulations and safety codes, as applicable.

(4) (1) The Thermal Power Plants shall be designed to comply with requirements stipulated in

(a) Central Electricity Authority (Technical Standards for Connectivity to the Grid) Regulations, 2007 as amended time to time;

(b) Indian Electricity Grid Code issued by Central Electricity Regulatory Commission (CERC);

(c) Applicable State Grid Code issued by appropriate Regulatory Commission;

(d) Central Electricity Authority (Technical Standards for Construction of Electrical Plants and Electric Lines) Regulations, 2010 as amended time to time;

(e) Central Electricity Authority. (Measures relating to Safety and Electricity Supply), Regulations, 2010 as amended time to time;

(f) Central Electricity Authority (Safety Requirements for Construction, Operation and Maintenance of Electrical Plants and Electric Lines) Regulations, 2011 and;

(g) Central Electricity Authority (Grid Standards) Regulations, 2010.

(2) The conditions stipulated in these Regulations shall prevail upon in case of contradictions.

5. The flexible operation of a power plant shall refer to the characteristics indicated in Fig. 1.

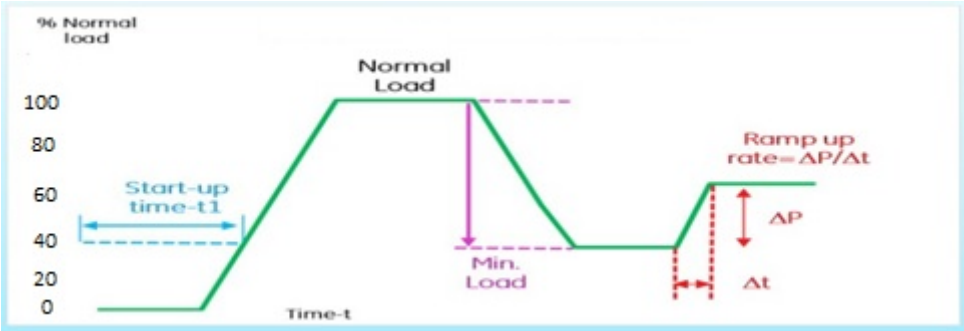

Fig 1: Characteristics of Flexibility

6. Suitability of units for flexible operation:

i. The units throughout their service life shall be considered for flexible operation**.**

ii. The suitability of units for start/stops and deep load following (Ramps) shall be assessed beforehand.

iii. The condition assessment of existing plant systems and its upgradation, if required, to accommodate operating requirements arising out of flexible operation shall be addressed beforehand.

7. Flexible Operation of the Thermal Power Plants (TPP):

i. All TPPs shall be capable of providing the required output as per the schedule for generation finalized by appropriate Load Despatch Centers. Based on the availability of must run stations, plants or units shall follow the variable load requirements.

ii. The appropriate Load Despatch Centers shall schedule all coal based thermal power plants, upto the MPL of 55%, to support the operation of must run stations.

iii. The appropriate Load Despatch Centers may schedule all coal based thermal power plants, upto the MPL of 40%, to support the operation of must run stations, subject to the provisions mentioned at Sub-clause (v) of this Clause.

~~iv.~~ The minimum rate of loading or unloading for coal based thermal power plants shall be 3% per minute above the MPL.

Provided that for supercritical and ultra-super-critical units, minimum rate of loading or unloading shall be 5% per minute above the MPL.

v. The thermal power plants shall implement the necessary modifications, if any, to achieve the requirements as specified in Sub-Clause (ii), (iii) and (iv) of this Clause to generate flexible power according to schedules finalized by appropriate LDCs.

Provided that the implementation of Sub-Clause (iii) and (iv) of this Clause would be completed by all thermal power units within three years from the date of notification of these Regulations, subject to the technical feasibility studies to be done in consultation with concerned OEMs or qualified consultants with regard to the requirements mentioned at Clause 6 and Clause 8 of these regulations.

Provided further that the implementation of Sub-Clause (ii) shall be implemented by all thermal power units within one year of the notification of these Regulations.

8. Process for implementing Flexible Operation of the Thermal Power Plants:

Measures to lower minimum limits of power output, increase the ramp rates and optimize the start-up of the power plants should be implemented based on technical feasibility studies involving assessment of the following factors in consultation with the concerned Original Equipment Manufacturers/ Qualified Consultants:

a. Rated Capacity
b. Minimum load Design rating with no oil support
c. Design Ramp rate.
d. Influence of low load operation on components and systems.
e. Technical boundary conditions for flexible operation
f. Combustion system optimization, co-ordination of mill and burner systems.

TPPs may decide adoption of suitable modifications in consultation with concerned OEMs/ qualified consultants.

9. Any deviation from the limits prescribed under these Regulations shall be brought before the Authority on case to case basis by the thermal power plants for exemption, if any.

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