# The Bureau of Energy Efficiency (Certification Procedures for Energy Managers) Regulations, 2010

UNION OF INDIA
India
The Energy Conservation Act, 2001

# The Bureau of Energy Efficiency (Certification Procedures for Energy Managers) Regulations, 2010

## Regulation
## THE-BUREAU-OF-ENERGY-EFFICIENCY-CERTIFICATION of 2010

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### 1. Short title and commencement. -

(1)These regulations may be called the Bureau of Energy Efficiency (Certification Procedures for Energy Managers) Regulations, 2010.(2)They shall come into force on the date [1] of their publication in the Official Gazette.

### 2. Definitions. -

(1)In these regulations, unless the context otherwise requires,-(a) "Act" means the Energy Conservation Act, 2001;(b)"Advisory Committee" means a committee constituted by the Bureau under sub-regulation (1) of regulation 13;(c)"agency" means the agency appointed by the Bureau for holding National Examination for certification of Energy Managers under clause (b) of sub-rule (1) of rule 2 of the Energy Conservation (Minimum Qualification for Energy Managers) Rules, 2006;(d)"Certified Energy Manager" means a person who has been issued a certificate under regulation 8;(e)"Form" means a Form appended to these regulations;(f)"National Examination" means a National Examination defined in clause (g) of sub-rule (1) of rule 2 of the Energy Conservation (Minimum Qualification for Energy Managers) Rules, 2006 and conducted accordingly under regulation 3;(g)"Register" means a Register of Certified Energy Managers maintained by the Bureau under sub-regulation (1) of regulation 9;(h)"Schedule" means the Schedule appended to these regulations;(i)"section" means section of the Act.(2)Words and expressions used herein and not defined but defined in the Act or the Rules made there under shall

have the meanings respectively assigned to them in the said Act or Rules.

## 3. Conduct of National Examination. -

(1)For the purpose of certification of Energy Managers, the Bureau shall, either by itself or through agency, conduct National Examination.(2)The Bureau shall, by publication in the newspaper, notify the date, time and place where such National Examination shall be conducted.(3)The National Examination shall be conducted in English medium.

## 4. Eligibility for appearing in National Examination. -

No person shall be eligible to appear for National Examination unless he possesses qualifications specified in sub-rule (2) of rule 3 of the Energy Conservation (Minimum Qualification for Energy Managers) Rules, 2006.

## 5. Application for admission to National Examination. -

(1)A person who is eligible to appear for the National Examination under regulation 4 shall seek admission for such examination by making an application to the Bureau in Form I.(2)Each application shall be accompanied by the following amount of fee payable by demand draft drawn in favour of the Bureau of Energy Efficiency, New Delhi, namely:-(a) Application fee-(i) for general candidates: rupees five hundred;(ii)for candidates belonging to the Scheduled Castes or the and Scheduled Tribes: rupees two hundred fifty;(iii)for candidates belonging to other Backward Classes having annual income of less than rupees four and lakh and fifty thousand per annum: rupees two hundred fifty;(b)Certification fee including Examination fee,-(i) for general candidates: rupees ten thousand;(ii)for candidates belonging to the Scheduled Castes or the Scheduled Tribes: rupees five thousand;(iii)for candidates belonging to other Backward Classes having annual income of less than rupees four lakh and fifty thousand per annum: rupees five thousand;(iv)for company sponsored candidates: rupees twenty thousand;(3)Subjects for National Examination shall be as specified in the Schedule.(4)A prospectus containing scheme and modalities for the National Examination including eligibility, syllabus and reference material for such examination, shall be made available by the Bureau at least three months before the actual date of examination.

## 6. Admission for the National Examination. -

(1)The Bureau, or the agency, as the case may be, shall, after scrutiny of application form and being satisfied that the applicant is eligible to appear for the National Examination, admit him for the National Examination by issuing him an admission card stating the place, date and time of the National Examination at least fifteen days before the date of the National Examination.(2)Where on scrutiny of the application under sub-regulation (1), an applicant is found ineligible to appear for National Examination, his application shall be rejected for reasons to be recorded in writing and he shall be intimated accordingly.

## 7. Passing of National Examination. -

(1)A candidate shall be declared to have passed the National Examination if he secures a minimum of fifty per cent. marks in each paper for the National Examination.(2)An unsuccessful candidate shall be allowed to take a maximum of three attempts per paper within six consecutive examinations held by the Bureau or the agency, as the case may be, on payment of supplementary fee of rupees one thousand five hundred per paper in the case of general candidates and rupees seven hundred and fifty per paper for candidates belonging to the Scheduled Castes and the Scheduled Tribes and also for Other Backward Classes candidates having annual income of less than four lakh and fifty thousand per annum, by means of demand draft drawn in favour of Bureau of Energy Efficiency, payable at New Delhi.

## 8. Certification of Energy Managers. -

For the purpose of certification of Energy Managers, the Bureau shall issue a certificate to the person who has passed the National Examination in Form II.

## 9. Register of Certified Energy Managers. -

(1)The Bureau shall maintain a Register of Certified Energy Managers in Form III and include the name of persons to whom certificates have been issued under regulation 8 in the said register.(2)On being registered as Certified Energy Manager under sub-regulation (1) of regulation 9, the Certified Energy Manager shall be issued an identity card in Form IV.(3)Each Certified Energy Manager shall be eligible to be designated or appointed as Energy Manager by the designated consumer under clause (1) of section 14.

## 10. Validity of certification. -

The certification made under regulation 8 shall be valid for a period of five years and renewable after every five years on an application made to the Bureau in Form V: Provided that no such renewal shall be made unless the Certified Energy Manager has attended a short-term refresher training course conducted by the Bureau or the agency, as the case may be, and has produced a certificate of participation issued in that behalf.

## 11. Cancellation of certification. -

(a)The Bureau may cancel the certification of an Energy Manager on a complaint made against him for-(a) any commission or omission amounting to professional misconduct;(b)any misrepresentation of facts, data or reports on energy consumption;(c)any act amounting to fraud;(d)failure to attend the refresher course:Provided that no such cancellation shall be done by the Bureau without giving an opportunity of being heard to such Energy Manager.(2) On cancellation of certification of Certified Energy Manager under sub-regulation (1), his name shall be removed from the Register referred to in regulation 9 and thereafter, the Certified Energy Manager

shall not be eligible for designation or appointment as Energy Manager by the designated consumer.

## 12. Issue of duplicate certificate or identity card. -

(1)Where the certificate or identity card issued respectively under regulation 8 and sub regulation (2) of regulation 9 has been lost by the Certified Energy Manager, the Bureau may, on an application made by him in this behalf, duly supported by a copy of First Information Report (F.I.R.) lodged with the concerned police station, issue a duplicate certificate or identity card, as the case may be, on payment of a fee of rupees one hundred by demand draft drawn in favour of the Bureau of Energy Efficiency, payable at New Delhi. (2) Where any certificate or identity card issued by the Bureau is damaged, the Bureau may on an application made in this behalf and on surrender of damaged certificate or identity card, issue a duplicate certificate or identity card on payment of a fee of rupees one hundred by demand draft drawn in favour of the Bureau of Energy Efficiency, payable at New Delhi.

## 13. Constitution of Advisory Committees. -

(1)The Bureau may, for the purpose of these regulations, National Examination for Energy Managers and for their certification and registration constitute an Examination Advisory Committee, a Technical Advisory Committee and a Certification and Registration Advisory Committee.(2)Each Advisory Committee shall consist of a Chairperson and not more than six other persons to be nominated by the Bureau from amongst members of the Advisory Committees constituted under regulation 3 of the Bureau of Energy Efficiency (Advisory Committees) Regulations, 2008.THE BUREAU OF ENERGY EFFICIENCY (CERTIFICATION PROCEDURES FOR ENERGY MANAGERS) REGULATIONS, 20101 SCHEDULE [ See regulation 5(3)] SUBJECTS FOR NATIONAL EXAMINATION 1: General Aspects of Energy Management and Energy Audit 1.1. Energy Scenario: Commercial and Non-commercial energy, primary energy resources, commercial energy production, final energy consumption, Indian energy scenario, Sectoral energy consumption (domestic, industrial and other sectors), energy needs of growing economy, energy intensity, long-term energy scenario, energy pricing, energy security, energy conservation and its importance, energy strategy for the future. 1.2 Energy Conservation Act, 2001 and related policies: Energy Conservation Act, 2001 and its features, notifications under the Act, Schemes of Bureau of Energy Efficiency (BEE) including Designated consumers, State Designated Agencies, Electricity Act, 2003, Integrated Energy Policy, National Action Plan on Climate Change. 1.3 Basics of Energy and its various forms: Electricity basics-Direct Current and Alternative currents, electricity tariff, Thermal Basics-fuels, thermal energy contents of fuel, temperature and pressure, heat capacity, sensible and latent heat, evaporation, condensation, steam, moist air and humidity and heat transfer, units and conversion, and Metric Ton Oil Equivalent (MTOE) conversions. 1.4 Energy Management and Audit: Definition, energy audit, need, types of energy audit, Energy management (audit) approach-understanding energy costs, bench marking, energy performance, matching energy use to requirement, maximizing system efficiencies, optimizing the input energy requirements, fuel and energy substitution, energy audit instruments and metering, precautions to be taken in the sampling and measurements, thermography, smart metering. 1.5 Material and Energy Balance: Facility as an energy system, methods for preparing process flow, material and energy balance diagrams. 1.6

Energy Action Planning: Key elements, force field analysis, Energy policy purpose, perspective, contents, formulation, ratification, Organizing - location of energy management, top management support, managerial function, roles and responsibilities of energy manager, accountability. Human resource development techniques, Information system-designing: barriers, strategies; Marketing and communicating- training and planning. 1.7 Financial Management: Investment-need, appraisal and criteria, financial analysis techniques-simple pay back period, return on investment, net present value, internal rate of return, cash flows, risk and sensitivity analysis; financing options, energy performance contracts and role of Energy Service Companies (ESCOs). 1.8 Project Management: Definition and scope of project, technical design, financing, contracting, implementation and performance monitoring. Implementation plan for top management, Planning Budget, Procurement Procedures, Construction, Measurement and Verification. 1.9 Energy Monitoring and Targeting: Defining monitoring & targeting, elements of monitoring and targeting, data and information-analysis, techniques-energy consumption, production, cumulative sum of differences (CUSUM). Energy Management Information Systems (EMIS). 1.10 Energy, Environment and Climate Change: Energy and environment, air pollution, climate change United Nations Framework Convention on Climate Change (UNFCC), Sustainable Development, Kyoto Protocol, Conference of Parties (COP), Clean Development Mechanism (CDM), Sample Procedure case of COM-Bachat Lamp Yojna and industry; Prototype Carbon Fund (PCF). 1.11 New and Renewable Energy Sources (NRES): Concept of renewable energy, Solar energy, wind energy, biomass boilers and gasifiers, biogas, bio-fuels, hydro, fuel cells, energy from wastes, biomethanation, wave, tidal, and geothermal. 2: Energy Efficiency in Thermal Utilities 2.1 Fuels and Combustion: Introduction to fuels, properties of fuel oil, coal and gas, storage, handling and preparation of fuels, principles of combustion, combustion of oil, coal and gas. Agro-residue/biomass handling, preparation and combustion. 2.2 Boilers: Types, combustion in boilers, performances evaluation, analysis of losses, feed water treatment, blow down, energy conservation opportunities. Boiler efficiency calculations for coal, oil and gas, evaporation ratio, Soot blowing and soot deposit reduction, reasons for boiler tube failures, start up, shut down and preservation, Thermic fluid heaters, and super critical boilers. 2.3 Steam System: Properties of steam, steam pipe insulation, assessment of steam distribution losses, steam leakages, steam trapping, condensate pumping, and flash steam recovery system, thermo-compressors, Steam utilization, steam dryers, Performance assessment of Steam system, and identifying opportunities for energy savings. 2.4 Furnaces: Classification, Forging furnace, Cupola, non-ferrous melting, Induction furnace, hot air generators, excess air, heat distribution, temperature control, draft control, waste heat recovery, heat balance and performance evaluation of a furnace, general fuel economy measures in furnaces. 2.5 Insulation and Refractories: Insulation-types and application, Cold insulation, economic thickness of insulation, heat savings and application criteria, Refractory- types, selection and application of refractories, and heat loss assessment. 2.6 Fluidized bed combustion (FBC) boilers: Introduction, mechanism of fluidized bed combustion, advantages, types of FBC boilers-Biomass-based fluidized bed combustion boilers, Atmospheric Fluidized bed combustion boilers, Circulating Fluidized bed combustion boilers, Pressurized Fluidized bed combustion boilers, application and operational features, retrofitting FBC system to conventional boilers, saving potential. 2.7 Cogeneration: Definition, need, application, advantages, classification, heat balance, steam turbine efficiency, tri-generation, micro turbines and saving potentials. 2.8 Waste Heat Recovery: Classification, advantages and applications, commercially viable waste heat recovery devices, saving potential. 2.9 Heat Exchangers: Types,

networking, pinch analysis, multiple effect evaporators, condensers, and distillation column. 3: Energy Efficiency in Electrical Utilities 3.1 Electrical system: Electricity billing, electrical load management and maximum demand control, Maximum demand controllers, power factor improvement and its benefit, selection and location of capacitors, performance assessment of PF capacitors, automatic power factor controllers, energy efficient transformers, Star labeled distribution transformers, Assessment of transmission, distribution and transformer losses. Demand side management, and losses due to harmonics and voltage unbalance. 3.2 Electric motors: Types, squirrel cage and slip ring induction motors and their characteristics, motor history sheet (new, 1st rewind, 2nd rewind), rewinding and motor replacement issues, Star operation, voltage unbalance, energy efficient motors, losses in induction motors, motor efficiency, Star labeled energy efficient motors, factors affecting motor performance, soft starters with energy saver option, variable speed drives, and energy saving opportunities. 3.3 Compressed Air System: Types of air compressors, reciprocating vs screw, compressor efficiency, efficient compressor operation, Compressed air system components, Air Driers, capacity assessment, leakage test, factors affecting the performance and savings opportunities. 3.4 Heating Ventilation Air Conditioning (HVAC) and Refrigeration System: Introduction to Psychometrics, Vapor compression refrigeration cycle, refrigerants, co-efficient of performance, capacity, ice bank system, performance assessment of window and split room air conditioners, factors affecting Refrigeration and Air conditioning system performance and savings opportunities, ventilation system, cold storage refrigeration, humidification system, Vapor absorption refrigeration system: Working principle, types and comparison with vapor compression system and saving potential, heat pumps and their applications. 3.5 Fans and blowers: Types, pressure drop assessment, performance evaluation, efficient system operation, flow control strategies and energy conservation opportunities. 3.6 Pumps and Pumping System: Types, performance evaluation, efficient system operation, flow control strategies and energy conservation opportunities. Energy conservation opportunities in boiler feed water pumps, pumping systems for municipal drinking water, sewerage, and agriculture pump sets, star labelled pumps. 3.7 Cooling Tower: Types, fan-less cooling tower, natural draft cooling tower, performance evaluation, efficient system operation, cooling water treatment, flow control strategies and energy saving opportunities assessment of cooling towers. 3.8 Lighting System: Light source, Light Emitting Diodes (LEDs), metal halides, fluorescent tube lights, Compact fluorescent lamps (CFL), choice of lighting, luminance requirements, energy efficient street lighting, electronic ballast, occupancy sensors, energy efficient lighting controls, labeling scheme, and energy conservation avenues. 3.9 Diesel/Natural gas Power Generating systems: Factors affecting selection. Waste heat recovery, energy, performance assessment of diesel/natural gas power generating systems. 3.10 Energy conservation in Buildings and Energy Conservation Building Codes (ECBC): About Energy Conservation Building Codes (ECBC), building envelope, insulation, lighting, Heating, ventilation, air conditioning (HVAC), fenestrations, water pumping, inverter and energy storage/captive generation, elevators and escalators, star labelling for existing buildings, Energy Service Companies based case studies. ---- 1. Vide Notification No. 2/11(2)/07-BEE, dated 15th October, 2010, published in the Gazette of India, Extra., Pt. III, Sec. 4, dated 30th October, 2010.

**1. Came into force on 30-10-2010.**