



## POWER (A) DEPARTMENT

**G.O. (Ms.) 19/92/PD, Dated, Thiruvananthapuram,  
3rd November 1992**

**Abstract-** Power Department-Conservation of Electrical Energy-  
Energy Audit Revised guidelines issued.

*Read-*

1. G.O. (Ms.) 12/92/PD, dated 30th May 1992.
2. G.O. (Ms.) 16/92/PD, dated 29th September 1992.

### ORDER

In the Government Order read as first paper above Government have made Energy Audit mandatory in High Tension and Extra High tension installations and high rise building/apartments in the State. The Committee constituted as per the Government Order read as second paper above has found it expedient to revise the guidelines issued as annexure to the Government Order read as first paper above.

Having considered all aspects Government are pleased to issue revised guidelines for energy audit in suppression of these issued in the annexure to Government Order as first paper above

(By Order of the Governor)

M.J. Santhakumari,  
*Joint Secretary to Government*

ANNEXURE TO G.O. (Ms.) 19/92/PD, DATED 3RD NOVEMBER 1992

### **Guidelines for Energy Audit**

1. Type - Energy Audit means different things in different contexts. The type of energy audit to be performed depends only the functions and type of industry or establishment and the depth of final audit needed. They can , however, be broadly divided into two categories.

- (1) Preliminary Audit.
- (2) Detailed Audit;

1.1 *Preliminary Energy Audit-* This is conducted by collecting relevant information from available data/records, visual and other information's. This give preliminary idea of the plant energy situation and forms the basis for detailed energy audit.

1.2 *Detailed Energy Audit*-This covers estimation of energy input for different processes losses, collection of past data on production levels and specific energy consumption in the subject energy consumption in the subject unit as well as in other systems.

2. *Procedure*- This mainly depends on the type of plant, size and processes.

2.1. *Pre-requisite*- The first step before starting an energy management programme is to select the auditor to whom the responsibilities of energy accounting and analysis is entrusted. The auditor should be direct directly answerable to the Chief Executive of the organisation and should get full support from other executives such as those controlling production, maintenance, finance, utilities etc.

2.2 *Categories of Energy Auditors*

(a) *Accredited Energy Auditor (AEA)*- Means as approved auditor, registered for the purpose of conducting energy audit. Registration may be in the name of individuals or firms.

(b) *Other Energy Auditor (OEA)*- Means a qualified energy auditor whom an establishment can engage to conduct internal audit and prepare audit reports. Individuals or firms may function as other Energy Auditors.

2.2.1 Establishments are free to carry out energy audit by their own qualified team or by any AEA/OEA of their choice.

2.2.2. Accredited Energy Auditor may be selected and registered by the Government.

2.3 Qualification of Energy Auditors-A person who conduct industrial or commercial energy audit shall.

(1) be a licensed professional or chartered engineer

(2) have an Engineering Degree\* from a college or University with a minimum of 5 years of subsequent experience in one or more of the following:

(i) For commercial energy auditing-Experience in air conditioning plant/Illumination Engineering

(ii) For industrial energy auditing-Experience in design, operation and maintenance of electrical installation in industrial processes.

\*Note.- This includes Electrical, metallurgical, Chemical, Production or Mechanical, Engineering Degree.

2.3.1 Accredited Energy Auditor shall have suitable technical team with him.

2.3.2 Energy Auditor must have necessary standard equipments (such as load analyser for measuring various electrical quantities) certified by a competent authority.

2.4. Data Collection-Utmost care should be taken to collect data accurately. The relevant data to be collected are

(1) M.D. and K.W.H. consumption for the last 5 years

- (2) Production figures for the last 5 years
- (3) Information regarding existing energy recording systems
- (4) Functioning of controls
- (5) Review of Maintenance and Records
- (6) Instrumentation of equipments installed
- (7) Capacities and efficiencies of all equipments
- (8) Prescribed operating parameters of equipments
- (9) present operating parameters
- (10) Over loading details
- (11) Steps involved in the production process

2.5. Data Analysis-The data collected under 2.4 are analysed to identify;

- (1) Energy wastage that can be prevented by maintenance or operational actions against.
  - (i) Equipment running when not needed
  - (ii) Equipment rated much higher than what is needed
  - (iii) Overloading
  - (iv) Substandard switch gears and wiring
  - (v) Mechanical defects in the driven equipments
- (2) possibility of waste heat recovery to generate steam and additional electric power using steam turbines such as in co-generation.
- (3) Possibility of eliminating or modifying production process to reduce energy usage.
- (4) Justification for replacing equipment with energy saving equipments.
- (5) Modernising the plant to save energy.

2.6 Energy Conservation Scheme- Based on the data analysis and audit reports energy conservation measures shall be prepared. The following procedures may be adopted:

- (1) Calculate energy saving for each equipment/feeder.
- (2) Calculate total cost of energy conservation measures and annual savings.
- (3) Evaluate pay back period, return on investment etc.
- (4) Assign priorities based on (3) above
- (5) Select measures for implementation.

3. Submission of Report and follow up action.

3.1. Electrical Energy Audit may be conducted once in a block of 3 calendar years and completed on or before 31st day of December of the 3rd year of each block. Audit report may be submitted before 31st March of the succeeding year to the appropriate authority:

Provided that the appropriate authority may require an establishment to conduct energy audit through an AEA (i) at a shorter interval or (ii) to verify compliance of measures implemented.

3.2. The appropriate authority shall scrutinize the audit reports and furnish comments thereon within 3 months from the date of receipt of the report for implementation.

3.3 The appropriate authority, if found necessary, may cause the audit report of an establishment prepared by an O.E.A. to be examined by an A.E.A., for which the establishment shall pay fees at rates prescribed by Government from time to time.

3.4 If an establishment is desirous of availing of notified incentives implementing the measures outlined in the audit report furnished by an A.E.A. the appropriate authority may refer such reports to the committee constituted by government for its recommendations. The committee shall furnish its recommendations no later than three months from the date of receipt of the report.

3.5 The establishments shall commence implementation of the energy conservation measures outlined in the audit report within 3 months from the date of receipt of the report.

3.6. Implementation of scheme- Based on the recommendations in the Energy Audit Report, necessary measures must be implemented to achieve conservation of energy and the same monitored on a regular basis.

3.7. Continuing efforts-The results achieved after implementation should be monitored on a continuous basis so as to ensure that the measures taken do deliver the desired results.

3.8. The establishments shall complete the project (energy conservation) and furnish a compliance report to the appropriate authority, within the time limit that may be prescribed by the appropriate authority.

3.9. On getting the Completion Report (C.R.) the appropriate authority shall inspect the premises and satisfy itself about the measures carried out. The authority shall also quantify the energy actually conserved by the implementation of various measures and make a report to Government.

4. Authority to whom report is to be submitted.

4.1. Chief Electrical Inspector to Government will be the appropriate authority to scrutinize the audit report involving statutory compliance and make recommendation to implement energy conservation measures in the establishments.

4.2. The committee constituted by Government will examine the audit reports where the establishments apply for notified implementation incentives and formulate necessary recommendations.

4.3. Kerala State Electricity Board will be the authority to conduct site inspection and physically verify the measures actually implemented by the establishment for conservation of energy.

4.4. Chief Electrical Inspector/Kerala State Electricity Board shall submit to the Government annual consolidated statements on the progress of the energy audit/the energy conservation achieved in the State during a financial year.